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THE EARLY TREATMENT OF ACUTE STAPHYLOCOCCAL OSTEOMYELITIS.[1]

By STANLEY W. WILLIAMS, M.D.,
Melbourne.

The Incidence of Osteomyelitis.

THE following statement shows the number of deaths in Victoria due to osteomyelitis in the years 1931 to 1936.

Year.	Number of Deaths.	Year.	Number of Deaths.
1931	33	1934	25
1932	29	1935	23
1933	33	1936	33

During the period 1925 to 1935 the incidence of acute osteomyelitis in children under the age of fourteen years at the Children's Hospital, Melbourne, was as shown in Figure I. These statistics show that there is an annual variation in numbers up to 40%, and, too, that there is a marked difference in the virulence of the infection, as the mortality varies from year to year by as much as 150%. Only the immediate mortality in the acute stage will be dealt with in this paper, although one realizes that a certain number of children die within a brief period of years after the primary bone infection. For comparison, the number of patients admitted to the Children's Hospital with tuberculosis of bones and joints is given. (See Figure II.)

These facts illustrate that acute osteomyelitis is a common and serious disease of childhood, for not only is the immediate mortality high, but the subsequent morbidity and mortality make it a disease worthy of the closest study.

In 1935 an opportunity was presented to investigate the value of newer methods of treatment in addition to the accepted surgical procedures. Dr.

[1] Read at a meeting of the Victorian Branch of the British Medical Association on July 7, 1937.

F. G. Morgan, of the Commonwealth Serum Laboratories, made available supplies of staphylococcal antitoxin and asked for it to be given a clinical trial. To appreciate the rationale of this form of therapy one must consider the ætiology and pathology of acute osteomyelitis.

In the series to be described the infecting organism was the *Staphylococcus aureus*. This organism was the cause of the bony infection in all with the possible exception of three patients with acute osteomyelitis admitted during the period from October, 1935, to May, 1937. In these cases of osteomyelitis the staphylococcus gains entry to the circulation by means of small sores (impetigo) or by abrasions; the *Staphylococcus aureus* appears in cultures from such sores. The organism may possibly gain entrance from the naso-pharynx.

In the circulation the staphylococcus may pass to the metaphysis of a long bone, where a focus of infection is set up. Owen[1] states that there is a thrombosis in a vessel of the bone, perhaps secondary to trauma, and the infection, coming from the skin or perhaps the nose, commences its spread at that site in the bone.

Staphylococcus pyogenes albus by the yellow pigmentation seen in agar cultures. It is worthy of note, however, that the *Staphylococcus aureus* may lose its pigment in culture, yet retain its characteristic pathogenic properties. The pigment has neither toxic nor antigenic properties, and is of the nature of carotin.[2]

A filtrable toxin was described as early as 1894 by Van de Velde,[3] and again in 1900 by Kraus and Clairmont, and in 1901 by Weisser and Wechsberg; but only comparatively recently, since the works of Julia T. Parker,[4] in 1924, and, of great local and general importance, by F. M. Burnet,[5] in 1929, at the Walter and Eliza Hall Institute, Melbourne, has interest been centred in the exotoxin obtained from cultures of *Staphylococcus pyogenes aureus*.

The products obtained in the filtrate of staphylococcal cultures have been demonstrated in animal experiments to be capable of producing four main effects, and it is a matter of controversy whether these changes are due to a single or to multiple toxins. The activity of the toxic products is in four chief directions:

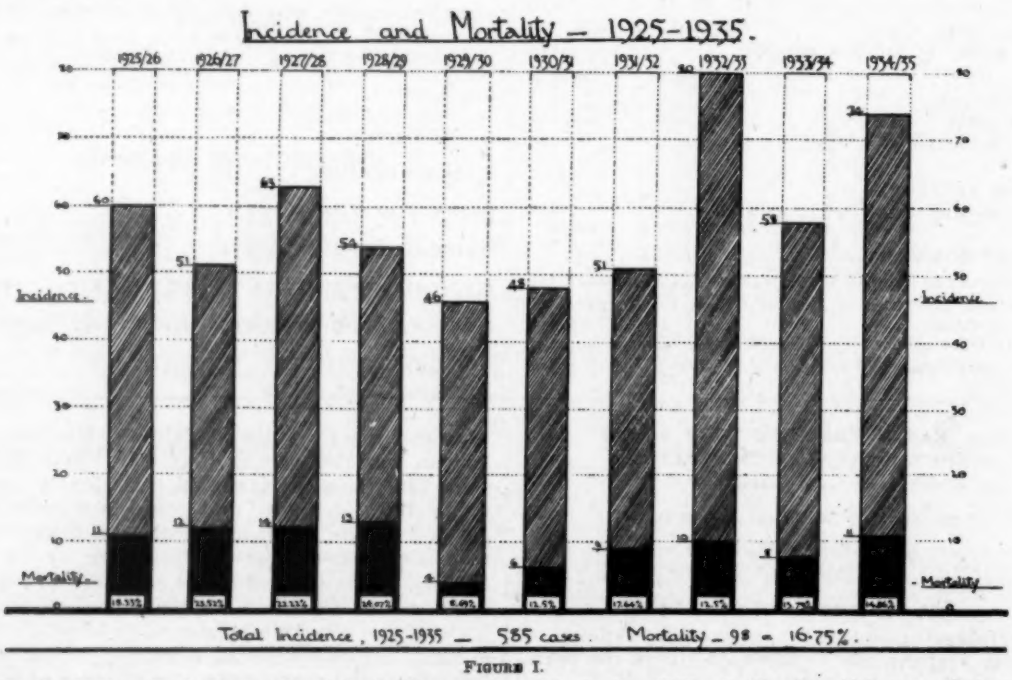

FIGURE I.

Graph showing the incidence of and deaths from osteomyelitis in the Children's Hospital, Melbourne, during the years 1925 to 1935.

For an appreciation of further pathological changes, at this juncture I propose to discuss the bacteriological and immunological aspects of the *Staphylococcus aureus*.

Pathogenicity of the Staphylococcus Pyogenes Aureus.

First described by Rosenbach in 1884, the *Staphylococcus aureus* was distinguished from the

1. Hæmolysis of red blood corpuscles. In the experiments, rabbit and sheep corpuscles have been used; but there is evidence, too, that the toxin will hæmolyse human red blood corpuscles. Chiefly by their effect on animal corpuscles Glenny and Stevens[6] distinguished between what they call an α and a β toxin. More recently, F. G. Morgan[7] has indicated the existence of an $\alpha 2$ toxin.

2. Tissue necrosis. There is a necrosing fraction which, when injected into the skin of an animal, causes destruction of tissue around the site of injection. Such necrosis is comparable with the destruction of bony tissue seen in osteomyelitis.

3. Destruction of leucocytes. A leucocidin or leucocyte-destroying fraction has been described by Panton and Valentine.[8] This leucocidin facilitates invasion of the tissues by cocci. Apparently certain leucocidins have no relationship to the hæmolysin toxin or to the necrosing fraction. More recently, however, Wright[9] (1936) shows that α hæmolysin and certain leucocidins are identical and that anti-leucocidin and anti-hæmolysin are sometimes the same antibody. J. T. Parker Weld[10] states that the hæmotoxic, necrotoxic and leucocidic properties are due to different constituents in the toxic filtrate.

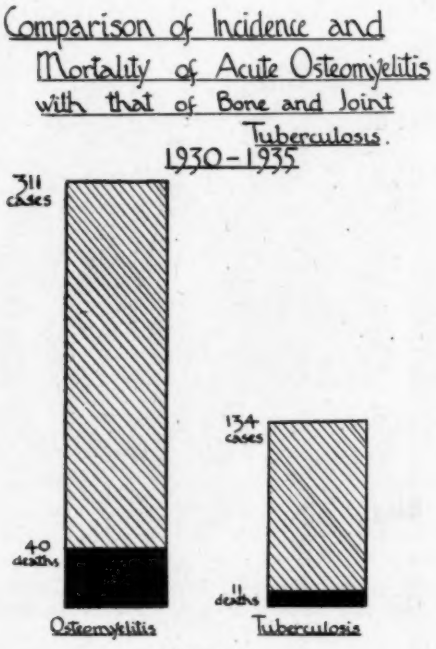

FIGURE II.

4. Coagulation of plasma. A plasma-coagulating substance is referred to by Dolman, who quotes H. Gross on the subject. This is probably the proteolytic enzyme of the staphylococcus.

The separate toxic constituents are therefore as follows:

(a) An α toxin, which is responsible for rabbit-cell hæmolysis and rabbit-cell leucocidin. It may cause destruction of human white blood cells. It will also cause skin necrosis, and has an acute lethal effect on rabbits.

(b) A β toxin, occurring predominantly in strains of bovine origin, but also in some cultures of human origin. It hæmolyses red blood cells of sheep and oxen. It has no known pathological effect.

(c) The Panton-Valentine leucocidin, which is produced in young cultures only and is quite distinct from α and β. It lyses human leucocytes.

(d) Coagulase, which causes clotting of citrated plasma.

Further, Burnet[6] (1929) also suggested that other factors besides the production of toxin play a large part in determining the fatal outcome in staphylococcal infections in animals.

We must wait for the laboratory workers to clarify these controversial points.

The Production of Staphylococcal Antitoxin.

The presence of exotoxin in the circulation of an animal stimulates the formation of antitoxin, and a great deal of experimental work has been carried out in this direction. The amount of circulating antitoxin can be estimated by laboratory methods. Burnet (1929) showed that rabbits could be partly protected by the injection of antitoxin prior to the intravenous injection of virulent toxin. One of the facts indicating the existence of a toxin was the ability with which an antitoxin could be produced. H. J. Parish and Winifred H. Clark[11] confirmed the formation of an antitoxin and suggested that it could be used clinically. Bryce and Burnet[12] showed that infants possessed a certain amount of natural immunity to the staphylococcal toxin. P. N. Panton, F. C. O. Valentine and V. W. Dix[2] prepared an antitoxin by injecting toxin into a horse. The serum was prepared on a large scale, concentrated and used for the treatment of several patients suffering from osteomyelitis, furunculosis and toxæmia associated with carbuncles. The dose varied between 10 cubic centimetres and 20 cubic centimetres intramuscularly and between 10 cubic centimetres and 30 cubic centimetres intravenously.

Production of antitoxin on a large scale, by injecting exotoxin into horses, has made possible its use in staphylococcal infections in man; but we must bear in mind certain disquieting features.

Owing to the variability of the fractions of toxin or toxins in staphylococcal infections, the antitoxin may vary, and, as pointed out by F. G. Morgan,[7] it is difficult to estimate the potency of a staphylococcal antitoxic serum in relation to the known pathogenic properties of the staphylotoxin.

F. C. O. Valentine[13] indicates that the value of an antitoxic serum depends more on the anti-leucocidin than on the antihæmolysin, but that death is due more to the hæmolysin than to the leucocidin. He points out that even if it is true that toxæmia and death result from the accumulation of hæmolysin and not of leucocidin, treatment should be directed towards the prevention of further invasion by staphylococci as well as to the neutralization of toxin already formed.

Pathology.

A description of the pathology of acute osteomyelitis will demonstrate the invading forces we have to combat in treatment. The staphylococcus enters the circulation by a superficial wound, or possibly it gains entrance via the naso-pharynx. As mentioned above, infection, carried by the blood, commences in the metaphyseal region of a long bone, the cause of the peculiar predilection for that site being a matter of doubt. It is suggested that

thrombosis in a blood vessel at that site, secondary to trauma of the limb, is the predisposing factor. Many patients certainly give a history of trauma associated with the infection. Necrosis of the bony tissue occurs as the organisms multiply and liberate their toxic products. The infection spreads peripherally to the periosteum, where pus forms, and the pus may accumulate along the bone between it and the periosteum (extramedullary infection) or within the bone (intramedullary infection). The infection then passes out into the muscular planes, spreading between the fibres and, depending on the site of the infection, the pus may become subcutaneous. The patient suffers from severe pain and there is tenderness over the site of the bony lesion.

FIGURE III.

Femur, showing separation of the periosteum at the lower end. No operation had been performed.

Generalized Effect.

Evidence of toxæmia is given by a high temperature, sometimes delirium, flushed face, dilated pupils, and occasionally a purpuric rash. In many instances the general toxæmia is the most noticeable feature, while the local bony infection may be quite small; in other cases the evidence of toxæmia is slight while the bony lesion is extensive.

Blood culture taken at this stage, in my experience, usually demonstrates the staphylococcus in the blood stream. Other workers have had a similar experience (Dolman).[14]

Several foci of infection are sometimes present in severe cases, and it is difficult to say which is the primary focus. It is probable that several foci may commence simultaneously, a fact easily understood when we know that the patients have a staphylococcæmia.

In the early stages of the staphylococcæmia several bony foci may be sown, although only one is evident; then later, what we generally regard as a metastasis may be the lighting-up of a previously unnoticed focus.

From a single focus or several foci of infection toxic products are distributed into the circulation, and we then have the complete picture of localized abscess formation and profound toxæmia. The infection usually proves fatal when abscesses develop in the lung or if the pericardium becomes involved. However, I have seen two patients with

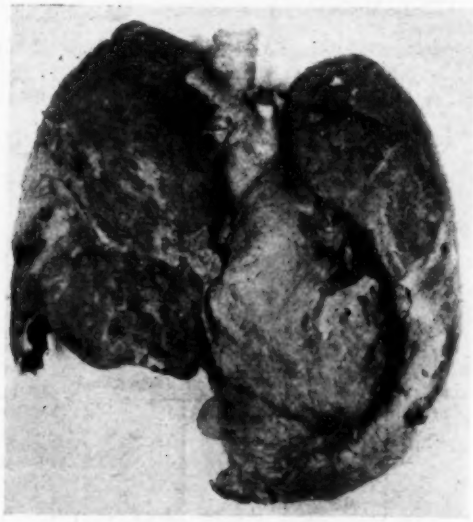

FIGURE IV.

Thoracic viscera, showing acute pericarditis and multiple lung abscesses due to the staphylococcæmia of acute osteomyelitis.

staphylococcal pericarditis recover, including one in this series, who had basal pleurisy and pericarditis.

The site of the abscess determines to a great extent the local treatment; but, in any case, whatever surgical treatment is adopted for the bony lesions, there may be deep-seated abscesses also in bone or soft tissue, and, further, there is the generalized effect of the toxins and other products of infection already produced and constantly being distributed. The effects of these must be combated by specific and general methods. If the exotoxin causes necrosis of tissue, hæmolysis of the red cells and destruction of phagocytes, and antitoxin neutralizes the exotoxin, it is the natural corollary that passive immunity treatment of acute staphylococcal osteomyelitis with antitoxin would give some hope of improving the results in this most serious disease of childhood.

Previous Clinical Observations with Antitoxin.

Treatment of osteomyelitis with antitoxin has not been used to any great extent, and previous workers are few. Valentine and Dix, as indicated above, reported favourably on the use of staphylococcal antitoxin in a small series of patients.

The largest reported series is that of Dolman,[14] who reports very favourably on the use of antitoxin in 32 cases of acute osteomyelitis in children. He states that in cases in which there is a positive blood culture the mortality rate, usually 50%, has been reduced to 31%. In his series the clinical condition of individual patients and not only statistical considerations was the chief method of assessing the value of serum therapy. He states that antitoxic serum therapy has undoubtedly proved a life-saving measure in many instances of osteomyelitis in childhood. The value of early diagnosis and the use of large doses of serum intramuscularly are emphasized.

Constant observation of the leucocyte response during treatment with staphylococcal antitoxin is recommended by Joyner,[15] who finds the ratio of segmented to non-segmented polymorphonuclear leucocytes an indication of the severity of the toxæmia and a convenient guide to the dose of antitoxin and frequency of administration. The mortality of 50% of patients untreated with antitoxin is higher than that found in our series. In 13 cases in which treatment by prompt and adequate surgical drainage and blood transfusion, supplemented by the administration of staphylococcal antitoxin, was given, two deaths resulted, indicating a dramatic response to the use of antitoxin.

Joyner says that the antitoxin will neutralize *in vivo* the exotoxins of staphylococci. Burnet has stated, however, that antitoxin injected into animals probably has no inhibitory effect on the multiplication of the staphylococcus.

The impression gained, therefore, by reading the reports of investigators using antitoxin during the early treatment of acute osteomyelitis is that it is a useful adjunct to surgical treatment.

An Investigation of Acute Osteomyelitis at the Children's Hospital, Melbourne.

The chief reason for this investigation was to try to ascertain whether any clinical benefit would follow the administration of staphylococcal antitoxin in acute osteomyelitis. The antitoxin used has been supplied by the Commonwealth Serum Laboratories, through the courtesy of Dr. F. G. Morgan, who expressed the wish that the serum be given to a control series of patients, those treated with serum being alternated with those treated without serum.

Serum has been administered to 24 unselected patients suffering from staphylococcal osteomyelitis, whilst during the same period, from October, 1935, to May, 1936, 42 other children with the same disease have been observed as controls. It is only by the study of a control series that we can arrive at a satisfactory conclusion as to the value of a method of treatment; for in osteomyelitis, as indicated above, the virulence of the infection and response to treatment vary greatly from time to time. All of the children in our series were treated surgically according to the requirements indicated at the time, a subject to be discussed later, the surgical and general treatment for the controls and those treated with serum being the same.

A statistical review will be given, comparing the results in the two series; but I should like to point out that it is impossible to give statistical facts to detail satisfactorily the success or otherwise of a particular form of treatment, although an attempt has been made to judge the two groups of patients along similar lines.

Response to treatment in osteomyelitis may depend on the length of time the disease has existed before the patient is admitted to hospital. In this series the average time was four days in the group of patients treated with serum, and five days in the other group. Any specific therapy will be more successful the earlier it is given; in most of our cases serum was injected on the day of admission or the following day.

The Time for Operation.

The question when operation should be performed is a very vexed one, different surgeons taking opposite views. According to many, the mortality and morbidity depend on the stage at which operation is performed. The object of operation is to drain pus, thereby preventing the local spread of the infection and diminishing the amount of absorption of toxic products into the circulation. Is it better to wait until the pus has localized, as in other staphylococcal infections, such as the boil or carbuncle, or should drainage be carried out early and the diseased bone removed? Does early operation disseminate staphylococci and toxins into the circulation before the patient has developed a good antibody response? The divergent opinions expressed by authorities show that we cannot give a decided answer to these questions. Professor J. Fraser[16] states that it is better to delay operation until the focus is established, and then there should be only the minimum of interference. An excellent discussion in London, reported in *The Lancet* of November 14, 1931, page 1079, indicates that it is best to delay operation until the pus is thought to be localized. C. E. Dolman[14] advocates early operation—"it is a surgical emergency"—and also, recently, J. H. Saint.[17] A summary of the work of Dean Lewis, Wade, Green and Fraser, in The Medical Journal of Australia of July 4, 1936, indicates that drainage should be adopted only when free pus is formed. J. C. Wilson and F. M. McKeever[18] suggest that operation should be delayed until after the first seven days, and they claim that good results were obtained by waiting up to twenty-eight days. A similar opinion, to allow the pus to become subcutaneous by withholding operation for as long as several weeks, or

even not to operate at all, was expressed by Fay McClure at the Alfred Hospital clinical meeting in 1936. W. B. Owen[1] discusses an early fixation point of infection which should be removed. It appears to me that the time of election for operation is when the pus has localized as much as possible in the bone and before there has been a spread to the surrounding muscles. As it is impossible to diagnose exactly the underlying bony changes, however, it seems that operation is best performed when the surgeon considers that there is pus in the bone; if there is any doubt, delay is indicated.

The average time in hospital before the children in this series were operated upon was two days, whether they received treatment by antitoxin or not. The average length of time elapsing between the onset of the disease and the operation was six days in the group in which serum was given, and seven days in the control group. In some cases the infection in the bone was localized in two or three days from the onset, while in others it was thought that the best time to operate was from twelve to fourteen days from the onset of the illness. All patients must be treated individually in this respect, those with a rapidly-spreading local infection requiring almost immediate operation, whilst in others operation is better delayed.

Operation.

The operation of Winnett-Orr,[19] with certain modifications, and subsequent immobilization of the limb in plaster, was performed in most cases, details of which I leave to those more qualified to write on this subject. From a study of the pathology of this disease, however, it is certain that in many cases there is little intramedullary spread of infection in the bone when there may be quite a large collection of pus under the periosteum. Therefore, as is well known, it seems necessary to make an exploratory drill-hole into the metaphysis or medullary cavity after separation of the periosteum, and to be guided by the amount of pus as to the extent of drilling or saucerizing of the bone.

Determination of the Infecting Organism.

In all cases culture of the pus was made at operation, and subsequent examination invariably showed a *Staphylococcus aureus*. Blood culture, performed in four instances, showed a staphylococcæmia. At autopsy cultures made from pus at the site of infection in the bone and the metastases demonstrated staphylococci. In one instance the organism was obtained from an infected sore on the foot, presumably the wound of entry, also from the bony foci, and at autopsy from the abscesses in the soft tissues.

Dosage of Serum.

As explained above, little comparison could be made between the potency of our serum and that used in Canada by Dolman.[14] It was therefore necessary to work out the optimum dosage for our own conditions. Our serum is standardized to contain 5,000 international units of antitoxin in 15 cubic centimetres, and was supplied in ampoules containing that amount, preservation being effected by the addition of tricresol (0·3%). Fifteen cubic centimetres of serum by intramuscular injection were administered to the first patient on the day of arrival at hospital. That dose was repeated two days later. The next patient received 15 cubic centimetres intramuscularly. Improvement was noticed in both of these children some seven days later.

The dose was increased to 30 cubic centimetres given intramuscularly to the next patient, in March, 1936. He had osteomyelitis of the tibia and was very sick; 15 cubic centimetres were given intravenously and 15 cubic centimetres intramuscularly on the following day. Metastases appeared in the mandible.

Dosage for the next patient was increased to 30 cubic centimetres intramuscularly on admission, 30 cubic centimetres intramuscularly the next day, 30 cubic centimetres intramuscularly two days later, and 30 cubic centimetres intramuscularly one day later, a total of 120 cubic centimetres intramuscularly. Then several children were treated with doses of 30 cubic centimetres intramuscularly on admission.

The site of administration may limit to a certain extent the amount of serum given, and the necessity of a dose of more than 15 cubic centimetres given intramuscularly to a small child is a troublesome feature. For larger doses, therefore, as it was thought intravenous therapy might cause severe reactions, the intraperitoneal route was used in several instances without any untoward effect. This route has been used by Banks[20] for a large number of patients receiving scarlet fever antitoxin. The intramuscular, intravenous or intraperitoneal routes were used, according to the size of the children and the amount of serum it was desired to give; but I would not advocate the intraperitoneal site as a routine, for at present it is uncertain whether plastic peritonitis may not follow the administration of serum given by that route. Larger doses, up to 105 cubic centimetres given intraperitoneally, and repeated once intravenously, have been used in the later cases. The results were as shown in Table I.

TABLE I.

Results of Treatment of Osteomyelitis by Staphylococcal Antitoxin.

Number of Patients.	Route and Dosage in Cubic Centimetres.			Result.
	Intramuscular.	Intravenous.	Intraperitoneal.	
2	10			Recovered.
5	15			Recovered.
1	23			Recovered.
5	30			4 recovered. 1 died.
1	120			Recovered.
1	30		30	Recovered.
1	15	20	20	Recovered.
1	15	15	30	Recovered.
1	30	105	15	Died.
1			60	Died.
3			105	Recovered.
1			210	Recovered.
1			285	Died.

Comparison of Results.

It was impossible to determine whether a fall in temperature was due to the administration of serum or to the operation, or perhaps to a combination of the two factors. The number of days before the fever subsided is shown in Table II.

TABLE II.

The Number of Days Before Fever Subsided.

	Average.	Maximum.	Minimum.
Patients treated with serum	19	70	3
Control patients	20	140	4

A typical temperature chart is shown in Figure V. It will be noticed that the temperature falls by lysis.

Follow-Up Investigation.

I cannot stress the importance of the results from a follow-up investigation, owing to the short period under review.

Sequestra: Sequestrum formation occurred in eight (33%) cases in which serum was given, and sixteen (38%) of the controls.

Metastases: Six (25%) of the serum-treated children had one metastasis, and three of these had two foci. Six (14%) of the controls had metastases; two of them had foci in two sites. (These figures do not include the number who died.)

Apparent Healing: Five (21%) of the serum-treated patients and fourteen (34%) of the controls are apparently cured. All these children are attending hospital for periodical review, and many are still receiving treatment.

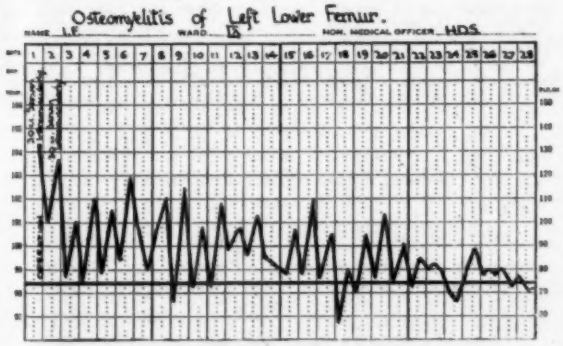

FIGURE V.

Chart showing temperature, amount of serum given, the route of administration and the stage of operation.

Mortality.

In the series studied the percentage mortality rate is the same in the two groups. This is shown in Table III.

In such a small series percentages are little indication; the figures for serum-treated patients would have been improved, too, if more had been treated with serum during the period from November, 1935, to April, 1936. If, instead of the 42 patients shown as controls, 24 of each group are compared over certain periods, the mortality rate in the control group is 25%. That the virulence appears to wax and wane is shown by the fact that six of the eleven deaths occurred in the period January to May, 1937; these included both serum-treated patients and controls. Since the use of the larger doses of serum, 60 cubic centimetres or more, there have been four deaths in ten cases, while in a corresponding number of control cases five deaths have occurred. The fulminating nature of the disease is demonstrated by a separate consideration of the deaths, which shows that the average time from the onset of the disease until the death of these patients was ten days in the serum-treated and eight days in the control cases.

TABLE III.

The Mortality Rate from Osteomyelitis.

	Number.	Deaths.	Percentage.
Patients treated with serum	24	4	16
Control patients	42	7	16

	Average Duration of Illness.
On admission to hospital (both groups) ..	2 days.
Operation (both groups)	4 days.
Death (serum-treated)	10 days.
Death (controls)	8 days.

Clinical Impression.

From these figures it seems that we have not obtained for the 24 serum-treated children much extra benefit. However, clinical impressions gained during the observation of these children were that a few patients may have been assisted by serum therapy.

CASE I.—C.F., a boy, aged twelve years, was admitted to hospital after having had severe pains in the right leg for three days. Coincident with operation he was given 10 cubic centimetres of antitoxin intramuscularly. The right tibia was exposed and drilled and the limb immobilized. Next day 15 cubic centimetres of antitoxin were given intramuscularly. The temperature gradually declined to 37·3° C. (99° F.) on the twelfth day.

CASE II.—W.H., a boy, aged thirteen years, had pain in the right leg for five days prior to admission to hospital. Operation was performed on the same day to drain pus from the tibia. Thirty cubic centimetres of antitoxin were injected intramuscularly on the first day. The boy looked very sick, with a temperature of 39·5° C. (103° F.) on the following day, so that 15 cubic centimetres of serum were given intravenously and 15 cubic centimetres intramuscularly. The following day a wider drainage of the tibia was necessary, and a focus of infection appeared in the mandible. He remained very sick for ten weeks and slowly recovered. In notes made at the time I have said that the serum may have helped to save this boy's life.

General Treatment.

The general treatment is of importance, and the details are well known. Small blood transfusions, of from 120 to 240 cubic centimetres (four to eight

ounces) have proved of value during the course of the disease.

Discussion.

If the pathological changes of acute staphylococcal osteomyelitis are due to the exotoxin, there is reason to hope that an antitoxin given in the early stages in large doses may be of value.

There may be many reasons why such a serum has not proved of very great value during this investigation; for example, the dosage in our cases is small compared with that used by Dolman. The disease is of such severity that further work is indicated to reduce the mortality and morbidity.

Suggestions for Future Work.

Suggestions for future work are as follows:

1. The encouragement of further bacteriological research on the *Staphylococcus aureus* to elaborate the possible toxic products.

2. Correlation of the antitoxic titre of the blood (which was found to be fairly high in a few cases of osteomyelitis estimated by Dr. Lucy Bryce) with other forms of treatment. If a rapid estimation of antitoxic titre could be made, then serum could be given to those patients with a low titre.

3. Routine blood culture.

4. The use of antitoxic serum in large repeated doses when indicated by the titre estimation. Again, control patients who are not given serum should be compared with those who have serum.

Summary.

1. A review is given of the literature, showing the existence of staphylococcal exotoxins.

2. It is still uncertain whether the known exotoxins cause the pathological conditions as found in acute osteomyelitis.

3. A staphylococcal antitoxin has been manufactured and used in conjunction with surgical procedures.

4. Results obtained in a series of 24 children treated with antitoxic serum compared with 42 control patients show that, by the methods used, the serum has not been proved of value. There is insufficient data to indicate whether better results are obtainable with large doses of serum.

5. Surgical treatment by the modified Winnett-Orr method is still the chief treatment.

6. Suggestions are given for future investigations.

Acknowledgements.

The cooperation of the members of the honorary medical staff of the Children's Hospital, Melbourne, has been much appreciated. Without the assistance of Dr. F. G. Morgan, of the Commonwealth Serum Laboratories, the investigation would not have been possible. To Dr. F. M. Burnet for much kindly advice, and to Dr. E. V. Keogh for many helpful suggestions, I owe a great deal. Many examinations have been performed in the pathology department of the Children's Hospital under the supervision of Dr. Reginald Webster, and I am also grateful to the members of the resident medical staff for their constant assistance. For the illustrations I am indebted to the Pathology Department of the Melbourne University and Miss Agnes Baldwin.

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SOME HEAD INJURY PROBLEMS.[1]

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IN order to avoid a didactic discussion on head injuries, and at the same time to make my own task lighter in dealing with a subject with so many sides and presenting so many complex problems, I have decided to pick out from the mass of subject matter available those particular problems which I think possibly cause the greatest difficulty in arriving at a decisive course of action. I would, however, immediately excuse myself from the responsibility

[1] Read at a meeting of the Central Northern Medical Association on March 12, 1937.

of laying down hard and fast rules; for it is to be remembered that we are dealing with the brain, the anatomy and physiology of which are as yet but most superficially understood. Consequently the pathology of brain disturbance is a subject which one is far from being in a position to treat with any dogmatism.

Taking the dictum of John Bell, uttered over one hundred years ago, as my text:

> We have this encouragement to consider the pathology in place of the anatomy, that while the enumeration or classification of fractures have led to an undue propensity to operation, the study of the living powers and the mutual dependence of these parts, leads to a reserved, modest and rational practice, to a just confidence in the powers of nature, to a careful and solicitous attention to all the insidious symptoms of an injured brain,

I will pass quickly over one or two problems concerning injury to the skull, and devote most of my time to injury of the brain.

Injury to the Skull.

From the surgeon's point of view, depressed fracture is a subject of some importance. Generally speaking, depressed fractures are compound. If there is no wound, there is probably no depression. This is not an invariable rule; but I would point out that where there is no wound there is no haste to solve the problem, for in these cases it is the wound and not the depression that matters. The indication is scrupulously to excise and clean the wound throughout its extent. This usually entails elevating and sometimes removing *en bloc* the depressed fragments, in order to be sure of absolute cleansing. When there is no wound, but merely a shallow depression revealed by X rays, I feel that there is rarely any indication for operation. It is unlikely that such depressions will cause any local damage or be responsible for late sequelæ. It is very rare for such a depression to cause direct pressure upon any important motor or association centre; but in this event the immediate effect would be obvious and elevation would be demanded. There is but little evidence that such shallow depressions *per se* will lead later to traumatic epilepsy.

If, then, such a depression is found by X rays and is not an obvious deformity, one may well debate the propriety of subjecting the patient to an operation for the elevation of the depressed fragment.

Injury to the Brain.

In dealing with the brain I shall consider cases classified according to the state of consciousness in which the patients are admitted to hospital.

First, we are familiar with the patient with a head injury, admitted deeply unconscious, cyanosed, with stertorous breathing, absent reflexes and dilated or unequal pupils. These patients all die, the great majority within twenty-four hours, and they contribute by far the greatest mortality—90% of deaths from head injury.

What can we do for these patients?

The sad answer to this question lies in the pathology. They all have grossly lacerated and contused brains, for which nothing can be done. Surgeons have tried for long enough to save such patients by urgent decompression. It is an illogical and useless procedure; for such patients are not the victims of compression, but of grossly damaged brains. Therefore we must be resigned to the fact that in this group there is an irreducible mortality rate. In a series of 718 patients with head injury admitted to Saint Vincent's Hospital, 35 were classified as deeply unconscious, and 22 of these died within twenty-four hours of admission. We may reasonably regard this as the unalterable mortality group. There was a total mortality of 35, the remaining 13 surviving for periods varying from two to fifteen days. It is into the group comprising these thirteen patients that we should look critically as possibly containing some patients who might have been saved.

The next class of case is that in which the patient is admitted, recovering consciousness, perhaps irritable and "uncooperative" for a time. The great majority of these go on to early recovery and cause no immediate problem. In this series 683 patients went on to apparent cure.

We have then the other class of case in which the patient remains unconscious, or becomes more deeply unconscious after admission, or possibly, being conscious on admission, lapses into coma.

It is with this small group that we are concerned in that some of them might have been saved from death by operative intervention. The pathological conditions which may be underlying these deaths are, owing to the unfortunate working of the *Coroner's Act*, often a matter of conjecture.

First we have to recognize that contusion may cause irreparable injury to vital centres. This may not be severe enough to cause immediate or early death, but may produce a condition of damage with which long continuance of life is impossible.

> A male, aged thirty-six years, was admitted to hospital after a severe head injury sustained in a motor car accident. He was unconscious for a few hours and then became unintelligently responsive. A few days later he was again unconscious. A hæmatoma being suspected, exploratory burr holes were made over each parietal region; but no hæmatoma was found. His condition continued unchanged, excepting that it would fluctuate between light coma and a semi-responsive or stuporose state. Lumbar puncture revealed low pressure readings on several occasions. At no time did he have any papillœdema or other neurological sign. His general condition rapidly deteriorated; he became incontinent, and after four weeks slowly died. *Post mortem* examination was not possible; but we can reasonably regard this as an instance of irreparable injury to vital centres; for there was no possibility of massive hæmorrhage, nor had there been evidence of increased intracranial pressure or any other local damage.

Secondly, there is hæmatoma formation, which may be either extradural or intradural.

Thirdly, there is the condition of general œdema of the brain.

Hæmatoma.

Undiscovered hæmatomata are the cause of death in the largest number of cases in the avoidable mortality group.

When are hæmatomata to be suspected?

There is much misunderstanding of this subject. We have been made too familiar with a classical picture of middle meningeal hæmorrhage, and in the absence of this picture we are too apt to brush aside the possibility, administer dehydrating treatment and think that everything possible has been done. In fact, however, the classical picture is classical enough, but rarely seen. Any collection of *post mortem* figures, such as in the statement below, will show that hæmatomata are constantly missed. The reason is that we expect too much from the hæmatoma.

Post Mortem Findings of Unrecognized Hæmatomata.

		Subdural.	Epidural.
Jefferson	100	9	5
Vance	512	132	—
McCreery	520	51	14

Any patient with a deepening of unconsciousness is a hæmatoma suspect, and if this is accompanied by some weakness on one or other side, the suspicion should be very strong indeed, and the burden of proof is urgent.

In so many instances one does not have an opportunity of seeing the picture develop at all, nor is the sequence of events noted by any experienced observer.

I was called to see a man, aged thirty years, who was deeply unconscious. His pupils were both large. He could not be made to move. His reflexes were equal. Babinski's sign was present on both sides. The history was that he had been injured in a motor-cycle accident and had walked to hospital, where a superficial injury was dressed. That night, while he was at dinner, he became weak in the left hand and then went to sleep and passed into a deep coma, in which condition he was brought to hospital. I took a superficial scalp injury on the right side as the only indication of side, and made a burr hole, which revealed a large extradural hæmatoma. I dealt with this through a small osteoplastic flap, and he recovered consciousness on the operating table and returned to work in a fortnight.

I was asked to see a lady, aged over sixty years, who, several days previously, had fallen over on some steps and hit her head, but had got up and continued her walk. A few days later she had complained of headache and gradually sank into a deep coma. When I saw her she was deeply comatose and breathing stertorously. She had a bilateral Babinski response and there were no localizing signs. There was no papilloedema. I immediately made a burr hole over the right parietal eminence and found no hæmatoma either outside or inside the dura. I repeated this on the left side and evacuated a collection of old dark blood from beneath the dura. She responded to questions at the end of the operation and made a very slow but satisfactory recovery, extending over a period of weeks.

These two cases illustrate the point that one most frequently has to be guided merely by a history of gradual loss of consciousness. When a patient is in hospital actually from the time of injury it is the observation of this state of consciousness which is of paramount importance. It is not sufficiently stressed. Observations of the pulse rate, usually scrupulously recorded, and of blood pressure, often laboriously taken, are of secondary importance only. I have seen several cases in which hæmatoma occurred and in which the chart of the pulse rate gave no useful information. On the other hand, I have seen several patients develop a marked and persistent bradycardia and retain their full consciousness and go on to recovery.

If the half-hourly pulse record takes the nurse to the bedside, it serves the most important function of keeping the patient under observation. At these visits a definite note should be made of the state of consciousness, as exemplified by response to speaking or shouted word, or light pin prick or actually painful stimulus. If at one visit a patient responds to a brisk order and two hours later is unresponsive to a pin prick on the lips, this observation is infinitely more important than any fall of pulse rate.

It is in such cases that one should act quickly, and I would not hesitate to make a burr hole over the temporo-parietal region on one side, and, in the event of finding nothing, to explore similarly the other side. In each instance the subdural as well as the extradural space should be opened. If there is a hæmatoma it will be found in this area, as they almost invariably extend over the whole hemisphere. The manœuvre, done properly, is a minor operation which cannot injure the patient. In such cases, if I find nothing, I do not feel at all shamefaced. I know where I stand.

Œdema of the Brain.

Œdema of the brain develops 24 to 48 hours after injury. It is characterized by stupor and irritative rather than paralytic symptoms. If there is no particular reason to suspect hæmorrhage, the condition may well be improved by dehydration methods, such as the administration of hypertonic saline solution and lumbar puncture. It is, however, most important to keep in mind that these measures may be highly dangerous in the presence of intracranial bleeding, and therefore I would insist that they should not be employed as routine treatment in head injuries, but only in cases in which progress is not satisfactory, and the correct diagnosis of œdema is made only after consideration of the possibility of hæmorrhage.

I should like here to refer to the uses of lumbar puncture as a diagnostic aid, and of this and other dehydrating methods in the treatment of patients with head injury. It should be an axiom that lumbar puncture is to be done only with a manometer attached to the needle. The normal pressure is 120 to 200 millimetres of water. This manometer will show whether there is an increase in intracranial pressure. An absence of increase, however, does not mean that there is no hæmatoma. The absence or presence of blood in the cerebrospinal fluid is an argument neither for nor against an intracranial hæmatoma. Therefore it would appear that lumbar puncture will not necessarily help in the diagnosis of this condition. On the other hand, if fluid is withdrawn in any quantity and an acute intracranial hæmatoma is present, even fatal damage may be done.

The conclusion is obvious that when intracranial hæmatoma formation is suspected, lumbar puncture

is of little value and far from being devoid of risk. When, however, hæmatoma is not suspected or has definitely been excluded, a withdrawal of cerebrospinal fluid so as to reduce the pressure to a normal reading is a rational and often a very beneficial procedure. For sundry reasons I consider that this is very rarely indicated within the first twenty-four hours following injury.

The oral, rectal or intravenous administration of hypertonic solutions has had a vogue rather ritualistic than rational. In the acute head injury we are not dealing with œdema, and dehydration has no use, but may in the presence of hæmorrhage greatly accentuate the trouble. After the period of the onset of œdema, when the patient is not making satisfactory progress and hæmatoma is not suspected, I think lumbar puncture should be performed and pressure readings made; if the pressure is high, the administration of hypertonic saline solution will probably be of advantage.

There are a few cases in which these dehydrating methods do not appear to be sufficient to overcome brain œdema, and in such cases a late decompressive operation may be required.

Sequelæ of Head Injuries.

We come now to consider some of those troublesome and pressing problems with which all of you are so familiar, namely, the late sequelæ of head injuries. These are, in order of frequency: headache, dizziness, loss of mental capacity, disturbance of personality, sleeplessness, epilepsy, and various cranial nerve injuries. Each of these conditions forms in itself a great problem, both to patient and to doctor as well as to the assessors of compensation.

There is one general observation of great importance in prognosis of all these sequelæ, and that is the patient's age. Among 200 patients carefully studied by Ritchie Russell, 6% of patients between fifteen and thirty years of age were unable to do full work eighteen months after injury; 21% between thirty and fifty years, and 46% of those over fifty were still incapacitated after the same length of time. This observation has practically no relation to the severity of the initial injury, as many of the younger patients had been unconscious for a long period.

Because of our limited time I propose now to consider briefly what we might call the surgical investigation of these cases.

The two classes we particularly see are those with severe post-traumatic headache and those with epilepsy. What can we do for these?

The surgeon must exclude any gross organic lesion. If neurological investigation and X ray examination reveal no abnormality, we may fall back on the method of encephalography. By lumbar puncture and the replacement of fluid by air we can usually obtain skiagrams of the ventricles, and if sufficient air is instilled the subarachnoid space will also be shown. The gross lesions we seek are chronic hæmatomata and post-traumatic distortions of the ventricle, the result of cortical scarring and shrinkage. In the first condition there is a shift of the ventricles away from the hæmatoma; in the second there is a pull of the ventricle in a diverticular fashion towards the side of the injury. In the great majority of cases the picture is normal. So frequently, however, is relief from headache experienced by the patient after encephalography that it has come to be regarded as in itself therapeutic when gross conditions do not exist. This is, of course, difficult to explain. The procedure is impressive and is followed by severe headache and discomfort for a few days. The patient is then assured that this examination of his brain shows everything normal, and there can be no doubt that this assurance is a matter of very great value to these frequently apprehensive and introspective patients.

A police constable had sustained a head injury twelve months before admission to hospital. He had been unconscious for a short time. Since then he had suffered from constant and intense generalized headache. This had been associated with fits of very bad temper and he had been incapacitated from work for 300 days in the year. Neurological and X ray examination revealed no abnormality. I did an encephalogram, introducing about 80 cubic centimetres of air. Radiograms showed the ventricles to be normal. After the usual severe headache, which lasted a few days following the encephalography, the patient announced that he was better. He returned to full duty within a short time and complained of no further symptoms.

To touch lightly on the question of post-traumatic epilepsy, I shall summarize the present surgical views. In the great majority of cases encephalography reveals no abnormality, and therefore there is no prospect of alleviation by surgery. When encephalography shows one of the gross changes mentioned, this should be dealt with. The days when depressed bones were elevated and dural adhesions separated, with a pious hope for the patient's recovery, have gone. Today the type of case which offers hope is that in which there has been, years before, a gross meningo-cerebral injury, usually associated with a compound fracture. A slow process of cerebral scarring occurs and a long diverticulum of the ventricle is pulled out into close approximation to the scar. This may be seen on encephalography. Such conditions should be treated radically by the careful excision *en bloc* of the meningo-cerebral scar right through to the ventricle, thus freeing the healthy brain around the scar. After doing this one sees the brain retract in a surprising manner. The results in such cases have not been uniformly good; but many have been most encouraging.

I shall quote a case referred to me some time ago, which, though not the result of an actual head injury, is analogous.

A man had had an old left frontal abscess drained years before. During the past year or so he had had severe epileptic fits, of long duration. Mentally he was dull and apathetic. Encephalography showed a long diverticulum of the ventricle coming up to the old scalp wound. I excised this *en bloc*. He made a rapid recovery. Everybody, including himself, noticed a great change in

his personality. He was brighter, more talkative, and much more interested in his surroundings. About a year has elapsed since the operation, and during that time he has had no fits.

And so it would seem that in this great history of vain efforts and lost causes at least one small section of the epileptic field may be capitulating to the long-tried assaults of surgery.

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THE RESULTS OF RADICAL ANTRUM OPERATIONS IN CHILDREN.

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THE radical, Caldwell-Luc or canine fossa operation with removal of the mucosa, for the relief of chronic maxillary antrum infection, has come in for a certain amount of criticism from time to time. The chief objections to it seem to be as follows:

A. In the adult: (i) severe infraorbital neuralgia in some cases for several days immediately after the operation; (ii) recurring discomfort in the canine fossa for a long time after the operation whenever the patient gets a cold; (iii) less satisfactory results when the mucosa is removed than when it is left to recover.

B. In the child: (i) destruction of the permanent teeth at the site of operation; (ii) unsatisfactory results. It has even been stated that doing a radical antrum operation on a child will turn him into a chronic invalid.

For these reasons some rhinologists perform only the intranasal operation, no matter how long the condition may have existed. This attitude is reflected in the late Dan McKenzie's well-known text-book (First Edition, page 334), where he says:

> The Caldwell-Luc operation is very rarely necessary. After the intranasal operation the antrum should be washed out twice daily till the discharge lessens, and then gradually stopped. The patient should be taught to do this himself. Muco-pus continues to be washed from the antrum in gradually decreasing quantities for a year or eighteen months, being profuse only when the patient gets a "cold". Finally it ceases.

To my mind the objections to the radical operation have been exaggerated and can be largely eliminated by certain technical details, such as the following:

A. In the adult: (i) Post-operative neuralgia can be avoided by the use of a broad retractor for the cheek tissues, so that there is an even retraction along the incision; if a narrow retractor is used, it pulls the central part of the incision too far cranially and the infraorbital nerve is dragged on. (ii) Recurrent discomfort in the cranial fossa can be eliminated by making as small an opening as possible in the canine fossa, consistent with an adequate inspection of the antrum, and by making a clean finish to the operation; that is, by seeing that no small pieces of mucosa remain in the vicinity of the opening. (iii) It is not my experience that the results are unsatisfactory when the degenerated antral mucosa is removed. There is no more satisfying operation in nasal surgery, provided that time is taken over the operation and meticulous care used to remove every trace of mucosa. It is difficult to find patients as complacent as those mentioned by Dan McKenzie. Moreover, it has not been my experience that badly degenerated or chronically inflamed mucosa does recover after antrostomy.

B. In the child: (i) Dentists ridicule the assertion that the permanent teeth would be damaged by the operation, and say that whoever makes such a statement does not know his anatomy. Naturally, in an operation on a child the opening in the canine fossa is made as high up as possible, without damaging the infraorbital nerve. (ii) With regard to poor results, the same remarks apply here as in the case of the adult. It has not been my experience that the results are unsatisfactory in private practice in those patients with whom I have kept in touch.

For these reasons I have never hesitated to do a radical operation on a child when I thought that the circumstances warranted it. However, in deference to the above criticisms, the records of children who have been operated on in private practice and in my clinic at the Eye and Ear Hospital, have been examined over the period 1921 to 1931, inclusive, and those of ten years of age and under (that is, before the eruption of the permanent canines and bicuspids) have been selected for a follow-up.

It has been found that forty such children underwent the radical operation. Many other children had the Caldwell-Luc operation, but the antral mucosa was not removed because it was considered that it would recover. These cases have not been included. Unfortunately, owing to the migratory habits of the hospital patients, it has not been possible to trace many. Only twenty of all patients have been located, including private patients. A *questionnaire* was sent to the parents, embracing inquiries concerning nasal obstruction, nasal catarrh, liability to head colds, chronic cough or bronchitis, general health and the condition of the teeth, especially the canines and bicuspids. All the children were operated on for long-standing nasal, aural or bronchial symptoms. The answers have been classified into good, fair and bad results.

ILLUSTRATIONS TO THE ARTICLE BY DR. EDWARD FORD.

FIGURE II.

Skull from the Gazelle Peninsula, New Britain, showing a circular trephine hole in the centre of a depressed fracture area.

FIGURE III.

A closer view of the skull in Figure II, showing the extensive area of injury and the thinned, healed margin of the trephine hole. The frontal sinus is opened by the lower opening.

FIGURE IV.

Skull from the Warrior Reefs, Torres Strait. The circular opening in the temporo-parietal region was probably made after death.

FIGURE V.

Boy from New Ireland, showing scars on the forehead due to trephining operation. (From Parkinson's *"Dreissig Jahre in der Südsee"*, 1907.)

ILLUSTRATIONS TO THE ARTICLE BY DR. RICHARD FLYNN.

FIGURE III.

X ray appearances after the injection of lipiodol into the bladder and urethra. Note the pouch-like dilatation at the distal end of the penile urethra.

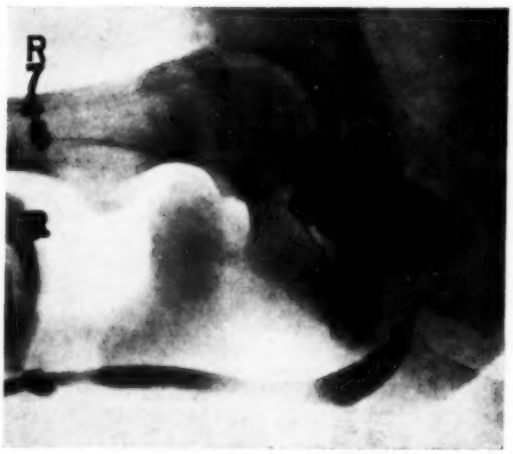

FIGURE IV.

Same as Figure III (lateral view).

The results have been good in thirteen cases. That is, the patients have grown into healthy children, who have no nasal or bronchial symptoms.

In three cases the results have been fair. The patients have improved since the operation, but still have some nasal symptoms or cough. Examination shows that their sinuses are healthy, but that they need some minor attention to the nose, such as removal of enlarged posterior ends of turbinates and the straightening of a septum. With this attention the results in these cases would probably be classed as "good".

In four cases the results are bad. That is, the parents state that the children have not been relieved to any extent.

One patient became affected with bronchiectasis and later entered another hospital, where ethmoidectomy was performed. Since then he has been better.

Another patient, who had only one antrum infected, still complained of nasal discharge and cough. She was readmitted to hospital recently and the offending antrum was reopened. A piece of infected mucosa was found in the outer angle, shut off by a fibrous web. Removal has relieved the patient of her nasal discharge and cough; but she still has occasional headaches and no doubt could now enter the "fair" class.

The two other patients live in the country and have not been examined. They both complain of nasal obstruction and catarrh, and the parents say that they are no better since the operation.

Of the patients in the "good" class, only those in my private practice have been reexamined. They are growing into strong, healthy children. The following details of a case are typical of this series:

A.N. was a very delicate boy prior to operation. He had suffered from diphtheria (three times), mumps, measles, chickenpox, quinsy, nasal catarrh, bronchitis, pneumonia and chronic earache. Tonsils and adenoids had been removed, without relief to the nasal catarrh and periodical attacks of deafness.

On August 17, 1928, at the age of four years, he underwent the double radical antrum operation. Both antra were found to be full of pus and polypoid mucosa.

He lives in another State, and last year his mother wrote of him:

> Since the operation he has had very little sickness. His nose is quite clear, and he does not suffer from colds. His hearing is excellent. All the teeth in the upper jaw have developed. He is now twelve years old, weighs eight stone six pounds, and his height is five feet five inches. I regard him as a normal healthy boy, full of life and vigour, and very seldom has a complaint of any kind to make. I feel I am indebted a great deal to the operation, which made such a wonderful transformation in him.

The youngest patient operated on was an infant, aged one year and nine months. The mother stated that three weeks after birth the baby contracted a cold in the head, since when she had had continual discharge of mucus from the nose and never seemed able to breathe through the nose. No relief followed the removal of adenoids, and the antra could not be washed through on proof puncture. The mother implored me to try to do something to relieve the distress of nasal obstruction. It did not seem feasible to do an intranasal antrostomy on so small a nose, so on August 3, 1925, a double radical operation was done. Both antra were developed to the size of a large pea and were completely filled with polypoid mucosa. This was removed and the operation was followed by complete relief of the catarrh and nasal obstruction. This patient has recently been examined. She has grown into a strong, healthy girl. She has some nasal catarrh in the winter, but is well in the summer. X ray examination of the sinuses shows that the antra have developed normally. The right antrum and the frontal sinuses are a little hazy. The left antrum and ethmoids are clear. All the permanent teeth in the upper jaw have erupted.

In regard to the replies about the condition of the teeth, fifteen patients are reported to have the full complement of permanent teeth in the upper jaw. Four patients have had bad teeth and have had numerous extractions, not particularly confined to the area of operation. One patient reports that the canine teeth on each side have not erupted.

Conclusions.

Only half the patients operated on during the period 1921 to 1931 have been traced. It is difficult to evaluate the operation on so small a series. In this small number the majority appear to have been completely relieved or improved.

Age is no contraindication to the radical antrum operation, provided the particular circumstances warrant operation, an infant of one year and nine months having been relieved.

As a rule the teeth are not damaged by the operation. In one case the patient reports that the canine teeth are missing. In the majority all the permanent teeth have erupted. It would seem that the fetish for doing only the intranasal operation in children is not justified. The following is a typical example:

M.McL., aged thirteen years, attended my clinic at the Victorian Eye and Ear Hospital last year. Her mother stated that for years she had suffered from a chronic cold in the head. Two years before she had had an operation on the antra from inside the nose, performed at another hospital. It had not made the slightest difference to her condition. A double radical operation was then advised and performed.

At operation it was found that the intranasal opening made elsewhere had been perfectly done, the whole of the antro-nasal walls below the inferior turbinates having been completely removed on each side, leaving a very large opening. This had not had the slightest effect on the grossly degenerated polypoid mucosa, which completely filled each antrum. Its removal at once relieved the patient of her chronic cold in the head.

TREPHINING IN MELANESIA.

By EDWARD FORD.

(From the School of Public Health and Tropical Medicine, the University of Sydney.)

THE practice of the trephining of skulls was widespread among ancient as among primitive living races. In Melanesia the operation was performed in localized areas by communities who used the sling or the stone-headed club as weapons of offence, and one has only to see the large number of cranial injuries in any collection of skulls from these parts to realize that ample opportunity arose for ingenuity in their treatment.

With the extension of European influence in the Pacific and the consequent abatement of intertribal warfare, the practice has fallen into disuse, and it is only upon a few scattered and usually inadequate reports, mainly by casual or unqualified observers, that we must rely for what little is known of the operation in these parts. Indeed, many points of great interest can now never be known.

Attempts have been made to trace the lines of diffusion of the practice from an original single source; but it is possible that the art arose in separate centres from the obvious immediate means of treatment for comminuted fractures of the skull, the removal of loose fragments of bone from an open wound, which was the simplest method applied in such cases.

The varied purposes for which the operation was undertaken in Melanesia suggest its development. It was used first as an immediate decompressing measure in the treatment of traumatic cranial injuries; secondly, as an attempted cure for constant and severe headache, vertigo, epilepsy and other ailments; and, lastly, in children, as a prophylactic procedure against the occurrence of such affections in later life. The remarkable results obtained by decompression in the first type of case would lead naturally, in such daring and astute operators as these surely were, to a trial of the method in the second group of ailments, and it is not too much to surmise that its extension as a preventive measure against these same illnesses might follow.

The native surgeon was apparently a man of dignity and standing, and his procedures were associated with sorcery, as indeed were those of the medicine men of most primitive races. Much skill and intelligence were displayed by them, and they were esteemed for their art alike as for their magic.

Parkinson,[1] writing of the natives of the Gazelle Peninsula, New Britain, where trephining was practised, stated that their medical skill was by no means insignificant, and their knowledge of anatomy, in consequence of their cannibalistic practices, considerable. They knew accurately the position of the internal organs, and in this respect their knowledge far surpassed that of the average European.

In the conduct of the operation great ingenuity was displayed in turning to use the facilities available. In regard to the bone-cutting instruments used, which included flakes of flint and obsidian, shark's teeth and sharpened shells, Parry,[2] who used them in the performance of experiments to ascertain how the operation could be done (as had Lucas Championnière[3] previously), remarked:

> For scraping a hole in bone, metal not being considered, there can be no better natural implement than a well-flaked piece of flint. When flint cannot be obtained . . . obsidian makes a good substitute . . . As regards sharks' teeth as surgical instruments, I am satisfied that there is no more effective natural implement for boring holes in bone than a hafted shark's tooth. Its keenly serrated edge and its sharp point make it an instrument invaluable to the primitive surgeon. It moreover possesses a natural flange which converts it into a trephine of undeniable utility, for the flange is so placed as to prevent the point penetrating too deeply and wounding the *dura mater*.

With an obsidian knife from the Admiralty Islands, Parry was able to trephine an adult male skull in the native method in thirty minutes. In addition to these cutting tools, an ingenious range of instruments was used, among which were bamboo knives, scoops of coconut shell, blowpipes for dislodging small bone fragments from a wound, forceps formed of two strips of coconut shell fastened together at one end, and needles of bone.

Trephining for Traumatic Cranial Injury.

It was as an immediate treatment for cranial injuries that the practice reached its highest point, and in these cases it must obviously have often been a life-saving procedure. In areas where sling-stones or stone-headed clubs were used in warfare, injuries to the head were probably the most frequent cause of violent death, and it was in these places that the operation was performed. Its use is also recorded in the treatment of injury received from falling coconuts.

From the Gazelle Peninsula, in the north of New Britain, we have the most complete record. Of the injuries treated in this area, Crump[4][5] wrote:

> The cause of the fracture of the skull is generally a blow from a sling-stone about the size of a pullet's egg, which the natives, in their tribal fights, throw with considerable force and fair accuracy at a distance of 200 yards or so . . . the depressed portions of the bone or hæmorrhage cause compression, and death almost invariably results if the injury is not attended to. Injury caused by the stone-headed club is almost instantly fatal, but the flat, two-edged club is not so deadly and permits of an occasional operation.

Powell, who visited this part of New Britain and the Duke of York Group in 1877, and there witnessed fights with sling-stones, commented upon the great force with which these missiles were delivered. He saw stones hurled to a distance of 250 yards with such force that they were broken against rocks, and one, aimed at himself, "buried itself in the stump of a coconut tree, showing with what terrible force they fly". In regard to the accuracy of the weapon, he wrote that he had seen a native knock a bird off a tree at a distance of about 100 yards.[21] Operation was not performed in all cases; but a selection was made by the surgeon. For instance, in New Britain, depressed fractures about the temple were regarded as fatal and an operation was not performed,[1] while in a case of the same injury to the frontal or occipital region the operation was immediately commenced.

The operative method varied in different parts and most probably with different surgeons, and, briefly, was as follows:

> The scalp was reflected till the whole area of bone injury was uncovered. If a comminuted fracture was then found the fragments were carefully removed and, in the case of obvious injury to the brain, hidden splinters sought. Then, by scraping with a sharp flake of flint or obsidian, sharpened shell, or shark's tooth, the projecting corners were removed from the margin of the opening until it

assumed a round or elliptical shape. If the fracture was not comminuted a round or oval hole was scraped over the centre of the injured area. The scalp was then replaced and the wound dressed in various ways.

The procedure as undertaken in the Blanche Bay district of the Gazelle Peninsula was recorded by Brodsky[6] (THE MEDICAL JOURNAL OF AUSTRALIA), who gives a detailed account of the elaborate dressings used in this area. In this description it is also mentioned that the hole formed at operation was plugged with a piece of native bark cloth, and in Parkinson's detailed account[1] it is noted that before the scalp flaps were replaced the opening in the skull was covered with a piece of the inner bark or inside leaf of the banana palm, which had been held for a short time over the coals of a fire. No details are obtainable of the healing of wounds complicated in this way by the inclusion of foreign material, though Fritsch[20] assumed that this was absorbed in the tissues. This practice of covering the bone deficiency is analogous to that of the Loyalty Islanders, who used a piece of coconut shell for the purpose.

The variation in the technique of the operation can be well seen from the different methods recorded as being used for the retraction of the scalp flaps during the procedure: by the hands of assistants,[4] by traction on locks of hair,[7] by traction on threads attached to the hair,[1] or by pinning them back with thorns.[4]

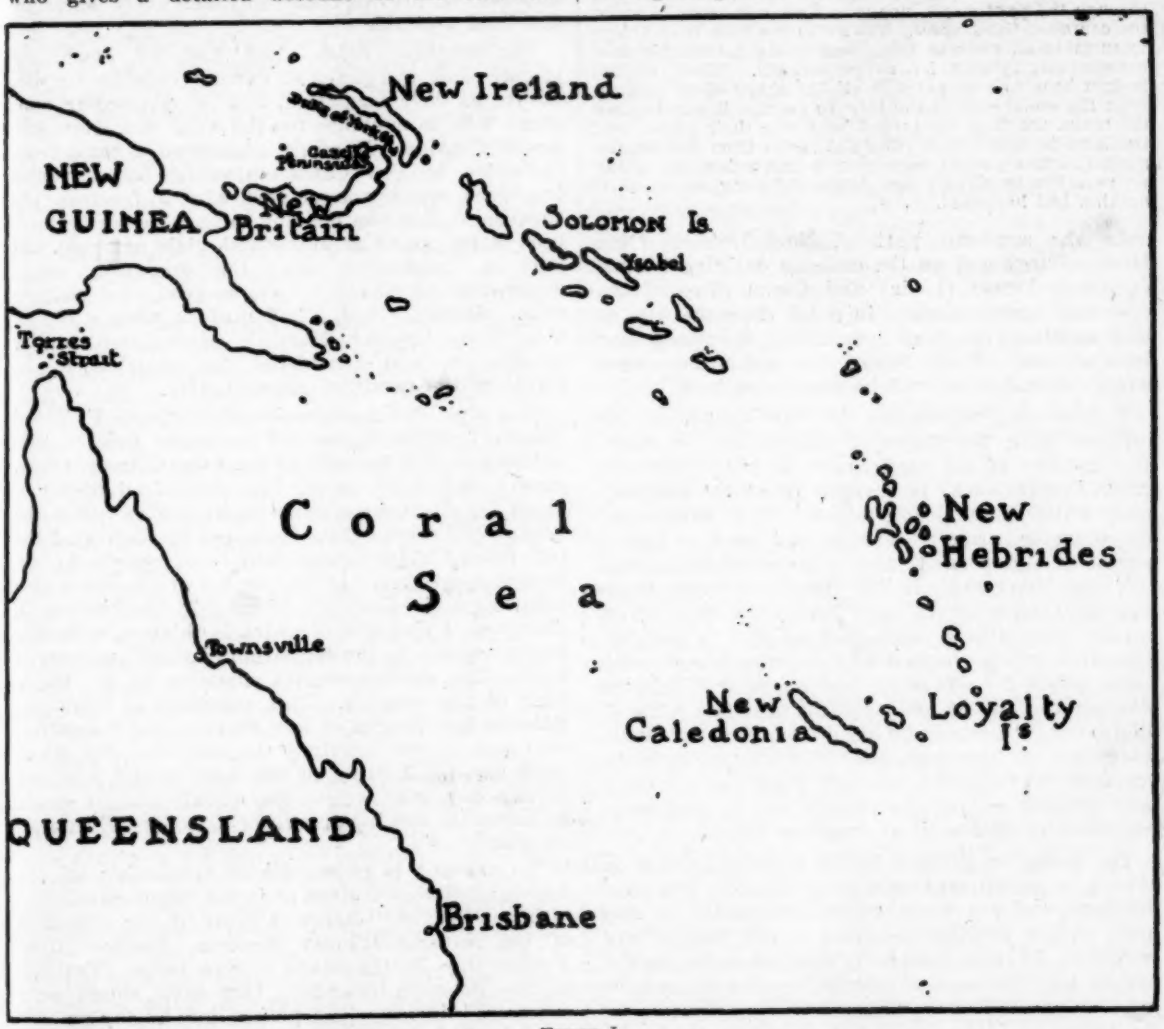

FIGURE I.
Map showing the location of various places mentioned in this paper.

In the Duke of York Group (Neu Lauenburg), to the north of that part of New Britain previously mentioned, the operation, undertaken for similar reasons, was described by Crump[4] in a communication to Brown:

When a man is hit (i.e., with a sling-stone) the services of the Tena-Papait or wizard are requisitioned and the unconscious warrior is laid in front of him. He cuts a

Y-shaped incision over the site of the fracture and dissects back the scalp from the wound, either pinning it there with thorns, or calling one or two assistants to hold back the flaps with their hands . . . Then, with a chip of obsidian, or a sharpened shell, or a flake of quartz, or even a chip from the thick part of a glass beer-bottle, he will cut and scrape the bone, using his dirty finger nail as an elevator, until all the broken pieces are removed and a hole is left as big as, or bigger than, half-a-crown, according to circumstances. No compunction is felt about cutting through the *dura mater*, nor is any attempt made to avoid the course of the sutures. The operation lasts from thirty minutes to an hour or more, and if the patient becomes conscious it is only for a few seconds. When all the broken bone is removed and all the sharp edges scraped from the under-edge of the bone to prevent it cutting into the brain, the flaps are turned back into their places, and the head is bound with sun-dried strips from the banana stalk . . . The patient may remain unconscious for a day or two, but in a very few weeks is going about as if nothing had happened.

In the southern part of New Ireland (Neu Mecklenburg) and on the easterly outlying islands of Gerrit Denys (Lihir) and Caens (Tanga) the operation was performed in much the same way as in those places mentioned previously; though in New Ireland and Gerrit Denys its indications were widely extended, as will be mentioned later.

It was also undertaken in New Caledonia for injuries from the blows of sling-stones or clubs. The liability of the participants in tribal fights to cranial injuries may be surmised from the accuracy with which these people could aim a sling-stone. An observer wrote[9] that he had seen a pigeon struck at eighty yards with a river-bed stone, and the same marksman, in five throws at flying fruit-bats at ranges up to sixty yards, knocked down three. Patouillet[9] said that on this island the operation was performed with cutting borers, with lance heads for elevators, but Sarasin[10] doubted whether the author had actually seen this himself. Waterston[11] described a skull from New Caledonia which had two openings, one of them rounded, in the region of the parietal eminence. These had evidently been present some time before death, and were regarded by Wölfel[12] as trephine holes.

The operation differed in the Loyalty Islands in that here an attempt was made to cover the bone deficiency with a plate of coconut shell; various more or less detailed accounts of this method are recorded. In these islands its use had also extended beyond the treatment of cranial injuries. Sarasin[10] gives an account of an observer of the operation on the island of Lifou performed upon a patient who had been struck upon the head by a falling coconut. The scalp was incised crosswise and lain back and the skull round the injured place scraped with a sharp splinter of glass until the brain was exposed in the opening. Water, supposedly as in other places that of the unripe coconut, was continually dripped onto the field. A piece of coconut shell was then scraped smooth and thin, and was set over the opening in the skull, and the scalp then brought into place. On the island of Ouvea (Uvea), in the same group, the operation was particularly frequently practised. Sarasin saw a woman with a coconut-shell plate over a trephine opening in the back of her head and heard of a man who had five such plates in different parts of the head.

In all of these areas where the operation was done the water of the unripe coconut was used to wash the wound, and, in some cases, the hands of the operator. This, since sterilization by heat was not understood, provided the only relatively bacteria-free fluid available.

The trephine holes often had an amazingly smooth and symmetrical outline considering the nature of their formation, and many circular ones might well be mistaken for the work of a European metal trephine. Martin[13] described a skull from Oubatche, in New Caledonia, which had a round trephined opening associated with a fracture; he considered that the opening must necessarily have been made, not by scraping with glass or stone, but with a trephining saw, the operation being supposedly performed by the surgeon of a visiting ship. Sarasin,[10] who had made a wide study of this area, thought Martin's explanation highly improbable, and considered the example to be certainly the result of native craft.

In a skull in the possession of Professor F. Wood Jones (Figures II and III) a round hole of this nature is associated with an extensive depressed fracture of the frontal region. This area, of a diameter of about 4·5 centimetres, is markedly sunken below the level of the surrounding bone, and the cavity of the left frontal sinus opens into it exteriorly by an irregular opening. In the centre of the depressed area lies a circular hole, about 1·75 centimetres in diameter, the margin of which is thinned, with fine serrations due to the formation of small spicules of bone. The surface shelves smoothly to the sharp edge of the opening. This specimen is from the Blanche Bay district of New Britain, and the native, who was known, survived the operation for many years, as the healing of the bone would confirm. In this case also the circular opening might easily be taken for the handiwork of a modern European surgeon.

No account is obtainable of trephining on the mainland of New Guinea or in the Solomon Islands, although Wölfel[12] figures a skull (in the collection of the Natural History Museum, Vienna) from Fasana Bay, on the island of San Isabel (Ysabel), in the Solomon Islands. This skull shows very extensive injuries, with fracture lines extending over the whole skull-cap, thought to be the result of a blow from a stone-headed club. About the point of impact of the blow a piece of bone had been removed with a scraping tool at or about the time of death, since no healing had occurred. It is not certain that this single isolated case from the Solomon Islands should be admitted as a planned surgical measure; for there is no proof that death did not occur before the operation of bone excision, and not after, or during it, as Wölfel suggests.

A skull from the Warrior Reefs, Torres Strait (Figure IV), which was presented by Dr. Vernon, of Thursday Island, to the collection of the School

of Public Health and Tropical Medicine, Sydney, shows a rounded opening about 3·5 centimetres in diameter in the right temporo-parietal region, with no evidence of any healing about the margin. There is no associated injury and the opening was considered to be the result of cannibalistic practice, the brain being removed through it without spoiling the skull. If in this case a fracture had accompanied the artificial deficiency in the bone, it could similarly, without proof, have been taken as the result of an unsuccessful surgical operation, although in this area, as in the Solomon Islands, trephining is unknown as a surgical measure.

Results of the Operation in the Treatment of Cranial Injuries.

From the number of skulls collected which exhibit proof of survival after the operation, as well as from the accounts of contemporary observers, it is evident that in these cases the operative results were remarkably successful. Parkinson,[1] writing in regard to the Gazelle Peninsula, New Britain, states that in most cases the operation was successful. He had not only seen a great number who had survived an operation years previously, but also had many skulls in his collection, many from natives whom he had known personally, which clearly showed the scraping and later healing of the margin of the trephine hole. An old native counted up for him thirty-one patients on whom he had performed the operation, and of these, twenty-three were still alive, of whom many were presented to the writer. One of these, a man aged about sixty years, had been successfully operated upon on two separate occasions, first when he was a youth, and again about twenty-five years later. The same author mentions that mental disturbance, either permanent or periodic, was known to follow the operation, but he knew of no case.

In the Duke of York Group, Crump advised Brown[4] that he had collected fifty skulls in a district less than ten miles square, all in good preservation and all showing considerable growth of new bone, proving that their owners had survived the operation. He therefore considered it fair to estimate the cases of recovery at a high percentage. In another account[5] the same author estimated the number of deaths at about 20%, most of these resulting from the first injury and not from any complication after the operation. Nearly all the deaths took place during or immediately after the operation, and Crump was assured that if a patient once became conscious, he seldom failed to make a good recovery.

Trephining for the Relief of Headache and other Ailments.

In the southern half of New Ireland, Gerrit Denys Island and the Loyalty Group, the indications for trephining were extended beyond those appertaining to traumatic injuries of the head, to various ailments which were probably thought to be due either to some form of intracranial pressure or to something for which an egress from the skull should be furnished, the analogy drawn from patients suffering from cranial injury perhaps influencing its adoption. Among those ailments for which an operation was said by various writers to have been undertaken were continuous severe headaches, epilepsy, fits, throbbing in the head, certain forms of insanity, neuralgia, vertigo, and "any tumour of the brain".

It was tentatively suggested by Cilento[14] that a high rate of epilepsy, due to the effects of the artificial cranial deformation practised in some parts of New Britain, might explain the esteem in which trephining was held on that island; but in New Britain the practice existed in separate areas, which did not overlap; nor has any record been found of an artificially distorted skull which showed evidence of the operation.

In New Ireland the opening was made over the site of localized pain or in the frontal region. According to Parkinson,[1] an incision was made and the frontal bone laid bare, then with a sharpened mussel shell a furrow was scraped in the bone, which was deepened until a fissure was formed through it. The scalp was then drawn together and herbs bound over the wound, which in a short time, usually about ten days, was said to be on the way to healing.

Crump,[5] who was the main source of information relating to the operation in this region, wrote:

> . . . on New Ireland (Neu Mecklenburg) the operation is performed not only in the case of fracture, but where there is epilepsy and certain forms of insanity as the result of pressure on the brain. I have in my possession a skull which has been successfully trephined in no less than five places, the man meeting his death some years after the last operation by a blow from an axe. This man suffered from severe headache with local throbbing. The operation was performed each time in the region of the pain; and though no cure seems to have been effective, the operation was at any rate perfectly successful. The most common form trephining takes on Gerrit Denys Island and the central part of New Ireland is cutting two or three channels down the forehead 3 to 4 inches long. This is done for headache and for what is described as beating or plucking sensation. There seems to be some benefit from trephining in cases of epilepsy at least for a time. One native at Falabog on the west coast of New Ireland with whom I conversed had been trephined on the top of the skull for this malady and has had no recurrence since the operation . . . . After trephining has been performed there is frequent partial temporary paralysis which almost invariably passes away, though in a few cases it is permanent. Idiocy is an occasional result also. But the natives affirm that while the cures of insanity are many, the instances where either malady supervenes after the operation are exceedingly low.

In another communication[4] (to Brown) the same author wrote:

> The natives there [New Ireland] are not only able to operate for injury but are able to locate any growth on the brain and successfully remove it by trephining. A man is subject to fits or feels a throbbing sensation somewhere in some part of his head and the wizard is called in and trephines the skull in one or more places and often succeeds in removing the tumour or other cause of the trouble. I have in my possession a New Ireland skull that has been trephined successfully no less than eight times. The cause of the trouble was not found till after the eighth operation. It was then, I am told, removed.

Whether or not tumours were diagnosed and removed—and in regard to the latter it is notorious that, during treatment, the medicine men of these parts almost invariably produced some object or other from the affected part, whether an operation was performed upon it or not—the dexterity of the native surgeon surely impressed this European observer.

After an examination of some skulls collected by Crump in New Ireland, Horsley[15] reported as follows upon one which had been trephined for headache:

> It is an ordinary case of making an excavation like a gutter into the skull, almost an exaggeration of a linear osteotomy . . . . In this case there has been an opening made of the inner table to a slight degree, to alleviate the sense of pressure from which patients suffering from all varieties of headache are so apt to complain of so persistently. The operation in this case has been over the frontal eminence, where people usually refer all forms of generalised headache.

In 1874, Ella[16] described the operation as it was then performed on the island of Uvea in the Loyalty Group:

> A notion there prevails that headaches, neuralgia, vertigo and other cerebral affections proceed from a crack in the head or pressure of the skull on the brain. The remedy is to lay open the scalp with a cross or T incision, then scrape the cranium carefully and gently with a piece of glass until a hole is made into the skull, down to the *dura mater*, about the size of a crown piece. Sometimes this scraping operation will be even to the *pia mater*, by an unskilful surgeon, or by the impatience of the friends, and death is the consequence. In the best of hands about half of those who undergo the operation die from it. Yet this barbarous custom, from superstition and fashion, has been so prevalent that very few of the male adults are without this hole in the cranium . . . . I am informed that sometimes an attempt is made to cover the membranes of the cranium so exposed, by placing a piece of cocoa-nut shell under the scalp. They select a very hard and durable piece of shell from which they scrape the softer parts and grind smooth, and put this as a plate between the scalp and the skull. Formerly the trephine was a shark's tooth . . . . The part of the cranium generally selected is that where the coronal and sagittal sutures unite, or a little above it, upon the supposition that here the fracture exists.

The statement above, that "very few of the male adults are without this hole in the cranium", Sarasin[10] considers to be certainly exaggerated; for all of the fourteen skulls from this island in his possession were untrephined. For this reason perhaps little reliance should be placed upon the high mortality rate noted as a result of the operation.

Hadfield,[17] who lived in the same group, stated that headaches were first treated with draughts of salt water and thereafter by sorcery, with the production of foreign bodies, as stones, hairs or shells, from the part by the doctor. If both of these methods failed to relieve the pain, it was assumed that something was wrong with the brain, and recourse was had to trephining.

> The only surgical instrument used for this delicate operation was a small piece of bamboo cane, or a sharp shell or stone . . . . The scalp was cut loose from three sides of the head and laid carefully back. The skull was then well scraped in the spot where the pain was felt to have been the greatest. Before beginning operations, the surgeon had prepared a piece of young coconut shell, by scraping it smooth and thin. This was now fixed on the skull, to cover the portion which had been scraped . . . Should the patient happen to faint during the operation . . . the surgeon . . . waited until consciousness returned. A white man who once witnessed this operation performed at Uvea on a lad about twelve years of age described to me the process as follows. The boy lay on the ground, and a cut was made on the scalp in the form of a cross, reaching almost from ear to ear. During the whole operation fresh water was dripping on the wound to wash away the blood. The piece of coconut shell used in this case was from an old nut, and about the size of a dollar piece. The operation occupied perhaps an hour . . . . The scalp was stitched with a needle made from the wingbone of a flying fox, and some of their own twine, which was fine and strong. That this operation has in no way affected the boy's intelligence I can confidently affirm . . . . This boy underwent the operation once only; but I have known natives of Uvea who have submitted several times, until one might believe that nearly the whole top of their heads must be a kind of mosaic work of coconut shell.

On the mainland of New Guinea cuts were often made on the forehead as a treatment for headache. At times these were so deep as to reach the bone,[18] but it is not reported that the skull itself was ever incised.

Trephining for the Prevention of Headache and other Ailments.

In some of those parts of Melanesia where trephining was undertaken for the treatment of headache and other affections, it was also performed upon children to protect them from these ailments during their subsequent life.

Parkinson[1] stated that in New Ireland it was performed only upon children between their second and fifth years of life, the mother of the child acting as the operator. In some districts the operation was done once only, while in others it was repeated twice or thrice. This writer saw the operation performed upon girls of two or three years, in the shallow water of a small stream. The small patient was held fast by several women while the mother scraped energetically at the uncovered frontal bone with a fragment of mussel shell. The scraping was continued until a narrow fissure was visible in the bone, about one centimetre long and 0·5 centimetre broad. The wound was then washed with water from the creek and leaves were bound over it. The patients seemed well and lively. The scars from this operation were very noticeable in later life, and extended from the middle of the forehead to the hair line. (See Figure V.) When two or three operations were successively undertaken, the scars lay vertically, side by side, from 2·0 to 2·5 centimetres apart, and, when palpated, a deep furrow in the frontal bone could be traced beneath them.

In the mountain district inland from Cape Matana-Tamberan, on the east coast of New Ireland, Poch[19] saw many young people with similar deep scars on the forehead. He was told that if young children fell on the forehead they would die if the blood was not evacuated, so an old woman directly made these incisions to that end. They were also done to small children of both sexes to make them strong.

At a meeting of the Anthropological Institute, London, Horsley[15] described a trephined skull from the village of Olatai, on the west coast of New Ireland. This was obtained by Crump, who said that many people in this village had been so trephined. The operation had become fashionable, and a handsome boy or girl was generally persuaded to submit to it as an aid to longevity, there being no absolute need for its performance.

In the Loyalty Islands, according to Hadfield,[17] any long delay in the closure of the fontanelle in a child's cranium was attributed to incest on the part of one or both parents, and it was believed that if nothing was done the head would become so enlarged that the child would either die or become insane. To prevent this, the native surgeon made a cut on the head of the child, probed about with his fingers until he reached the soft place, and over this plastered chewed bush or leaves to cause the bones to cement.

The extension of the practice so far beyond its primary use in the treatment of cranial injuries, as indicated in the above accounts, is, in addition to being an index of the skill of the Melanesian craftsman, a monument to his experimental faculty.

Summary.

In Melanesia skull trephining was formerly performed in the Gazelle Peninsula of New Britain, in the southern part of New Ireland and certain outlying islands, in New Caledonia and in the Loyalty Group.

The operation was undertaken for the immediate treatment of traumatic cranial injuries, and in certain areas its performance was extended to the treatment of severe headache and other ailments, and as a prophylactic measure, in children, against the occurrence of such affections in subsequent life.

The procedure has, since the European domination of the Pacific, fallen into disuse, and contemporary descriptions of the operation are scanty and for the most part fragmentary. The details have been collected from these sources, as far as available.

Acknowledgements.

My thanks are due to Professor F. Wood Jones and to Professor Harvey Sutton for their kind permission to use material in their collections, and to Mr. Frank H. Taylor, Mr. W. Preston and Mr. H. Marriott for the photographs.

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Reports of Cases.

INFLAMMATORY STRICTURE OF THE RECTUM.

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IN the light of the views expressed by Dr. W. Frei in an article published towards the end of 1932, entitled "The Present State of our Knowledge upon the Genito-Ano-Rectal Syndrome", the two following cases may prove of interest.

Case 1.

C.B.,[1] a single woman, aged thirty years, was admitted to the Prince Henry Hospital on March 24, 1937, suffering from recto-vaginal fistulæ. The woman's past history was as follows.

Some fourteen years before she had contracted an infective ulcerative proctitis and had been treated by rest and antiseptic irrigations for approximately ten months. During her sojourn in hospital an abscess (? ischio-rectal) developed on the left side of the anus and had to be incised. At this period some contraction of the bowel was noted, about 10·0 centimetres (four inches) from the anal margin. In 1930 fæces commenced to be discharged *per vaginam* and there had been a profuse fæco-purulent discharge, frequently blood-stained, from both anal and vaginal orifices, ever since. During the previous seven years there had been intermittent attacks, resembling subacute rheumatism, during which the right knee became swollen, tender and inflamed. The menstrual history was characterized by long intervals of amenorrhœa amounting even to seven years. For many years the patient's general health had been indifferent; she had been a misery to herself and not any comfort to her family. In fact, the admission clerk entered up her occupation as "invalid".

On examination on April 7, 1937, the patient presented well-marked signs of septic absorption. Pronounced excoriation was present around the anus, and the labia were dotted with multiple small superficial ulcers.

The anus was patulous and led into a funnel-shaped rectum, at the apex of which, some 7·5 centimetres (three inches) above the anus, was a dense stricture, just admitting the tip of the index finger. The stricture was fixed and was adherent anteriorly to a large mass of peri-

[1] This patient was shown at a meeting of the New South Wales Branch of the British Medical Association held at the Prince Henry Hospital, Little Bay, on August 12, 1937.

rectal inflammatory thickening, with which the body of a retroverted uterus was inseparably blended.

Three recto-vaginal fistulæ were present; two in the right fornix comfortably admitted a large probe, whilst through a larger one in the posterior wall, near the vulva, the tip of the little finger could be introduced into the rectum.

There was no reaction to the Wassermann or Kline-Young test for syphilis, nor to the Neisserian complement deviation test. The leucocyte count amounted to 11,600 per cubic millimetre (neutrophile cells, 61%; lymphocytes, 30%; and eosinophile cells, 9%).

The Frei intracutaneous test was not carried out, as there were no stocks of antigen available in New South Wales.

On April 12 a left iliac colostomy was performed and the rectal stricture was dilated to the size of a number 17 Hegar's dilator.

The after-treatment consisted in washing the lower bowel through from the colostomy wound daily with hypertonic saline solution and the bi-weekly passage of Hegar's dilators. Owing to the contraction of the fibrous tissue, the introduction of Hegar's dilators was a difficult process and caused some pain.

On June 6 an anæsthetic was again administered and the rectal stricture dilated to the size of a number 24 Hegar's dilator. As a battery was not available, cataphoresis of the rectum was delayed until early in June.

By the middle of July all acute inflammation had subsided, the lower recto-vaginal opening had completely closed, and a number 24 Hegar's dilator could be passed easily through the stricture.

Eight sessions of cataphoresis by zinc electrolysis have now been carried out, each of ten minutes' duration, and at approximately weekly intervals.

The pain and discharge were relieved after the first five applications, the general health has much improved, and there has been no further advance of ulceration.

Case II.

R.H.G., a male, aged twenty years, who had recently undergone four rectal operations (two for fistulæ and two for perianal abscesses) at a metropolitan hospital, was operated upon on October 17, 1931, at the New South Wales Community Hospital, for a right-sided ischio-rectal abscess associated with an anal fistula.

Microscopical examination of a snipping taken from the wall of the fistula showed "inflammatory and necrotic changes, but no evidence of tubercle". Smears taken from the evacuated pus revealed "numerous pus cells, no organisms and no tubercle bacilli". Cultivations produced *Staphylococcus aureus*, and between October and Christmas, 1931, the patient received graduated doses of an autogenous vaccine.

Although after twenty-four hours von Pirquet's reaction was only slightly positive, by the time forty-eight hours had elapsed a strong positive reaction was in evidence.

On May 3, 1933, an anal fissure was excised. Two months later (June 25, 1933) the patient was referred by Dr. Hyam Owen on account of a profuse purulent rectal discharge amounting to about 120 cubic centimetres (four ounces) at the time of rising, but not more than 45 cubic centimetres (an ounce and a half) thereafter throughout the day.

On examination a rectal stricture admitting the tip of an index finger was felt approximately 7·5 centimetres (three inches) from the anal orifice. Lying on the left lateral wall, immediately above the stricture, was an area of submucous infiltration about the size of the terminal joint of the index finger, whilst at a corresponding point below was a polypoid mass the size of a walnut. A snipping was taken from the latter, and the histological report read: "Sections showed inflammatory changes only."

There was no reaction to the Wassermann test. Irrigation of the rectum, combined with dilatation of the stricture twice a week, was recommended, and cataphoresis by zinc electrolysis was ordered to be carried out at fortnightly intervals.

The radiological report of December 18, 1933, read as follows:

> There are several small diverticula on the right side of the rectum and there is some constriction of the whole of the rectum. There is also an irregular constriction of the pelvic colon with its junction with the rectum. This is possibly the result of adhesions or of some thickening of the bowel wall. The rest of the colon appears clear as far as the hepatic flexure.

The above treatment was only moderately successful, so on March 19, 1934, appendicostomy was performed with the idea of permitting more efficient daily irrigation of the rectum. At this period the stricture would just admit a sigmoidoscope, and, although the submucous infiltration appeared to be unchanged, the mucous membrane both above and below the stricture was intensely injected and inflamed.

The Frei intracutaneous reaction was not carried out, as no stocks of antigen were available in Australia.

The patient left hospital on April 5, 1934, omitted to attend for either dilatation or ionization, and was not seen again until July 3, 1934.

The purulent discharge had recurred. The submucous infiltration now encircled the rectum; the stricture had contracted to its original size, and its lumen was obscured by a series of papilla-like projections growing from the mucous membrane immediately below the stricture.

Great difficulty was experienced in re-dilating the stricture. In the early stages this had to be accomplished by direct vision through a proctoscope.

By Christmas, 1934, a $^{35}/_{16}$ Hegar's dilator could be passed through the stricture, and the polypoid projections were very much smaller. Four months later, although colonic irrigation had been omitted for two months, a sigmoidoscope could be passed through the stricture, but there was still a slight purulent discharge from the bowel. Irrigation was resumed for a further six months.

In March, 1936, as the purulent discharge had ceased, the appendicostomy opening was closed and the patient was advised to return at quarterly intervals to have a number 24 Hegar's dilater passed through the stricture.

Comment.

Until comparatively recently syphilis has been usually regarded, on somewhat unconvincing evidence, as the common ætiological factor in inflammatory stricture of the rectum; but the modern view is that this malady owes its origin to an ultra-microscopic filtrable virus, initiating diseases so varied and diverse as climatic bubo and *lymphogranuloma inguinale* (poradenitis), *esthiomène* and inflammatory stricture of the rectum.

In *The Australian Medical Gazette* of May 10, 1913, Dr. A. J. J. Triado reported fifty cases of tropical or climatic bubo occurring amongst the white male population of Marble Bar, Western Australia.

From time to time cases of subacute inguinal lymphadenitis are met with in the County of Cumberland, in which the glands of oblique set become slowly and progressively transformed into an agglomeration of enlarged glands glued together by a plastic periadenitis and forming an oval-shaped lobulated hard swelling up to the size of a hen's egg. Resolution may occur; but more commonly suppuration ensues, and the pathologist is unable to demonstrate any organisms in the evacuated pus.

The intracutaneous reaction devised by Dr. W. Frei some ten years ago placed the ætiology of genito-ano-rectal syndrome upon a more secure footing. More recently the value of this particular test has been amply confirmed from cities so widely separated as Stockholm (S. Hellerstrom), Rotterdam (E. H. Hermans), London (H. M. Hanschell), Cleveland (De Wolf and Van Cleve) *et cetera*.

Unfortunately in the past the necessary antigen has not been available in New South Wales; but a member of the staff of the School of Public Health and Tropical Medicine within the University of Sydney has kindly undertaken to secure supplies and test out the cases reported here.

The characteristics of inflammatory stricture of the rectum were very ably summarized by Professor Henri Hartmann, of Paris, at the opening of a discussion on this malady before the Medical Society of London in 1923 as follows:

The course is long (10 to 15 years); females preponderate in the proportion of 4 to 1; susceptible ages are 20 to 50 years; the site is 2 to 6 centimetres above the anus. This low-placed tubular stricture occurred in 78 of his 86 cases. As a rule the surface of the stricture is not ulcerated; the mucous membrane below is commonly inflamed and ulcerated; condyloma-like growths appear about the anus and fistulæ develop. Fistulæ are often multiple and open nearly always into the rectum just below the stricture.

HYPOSPADIAS TREATED BY THE OMBREDANNE TECHNIQUE.

By RICHARD FLYNN,
Sydney.

W.F., A MALE, aged thirteen years, consulted me because of pain in the right iliac fossa of six months' duration and "bilious attacks". He also complained that his testicle was not in the scrotum and that he had to sit down to micturate otherwise he wet his clothes. On examination he was found to be tender over McBurney's point; his right testicle was not palpable in the scrotum or groin and he had a penile hypospadias with which was associated the usual curved penis.

FIGURE I.
The appearances after operation (side view).

On July 17, 1935, his appendix was removed; the testicle was brought down into the scrotum and maintained there according to the Cabot technique. The associated inguinal hernia was repaired and the first stage of the cure of hypospadias was accomplished, namely, straightening of the penis.

On November 30, 1935, the second stage of the Ombredanne operation was done, and because I think that in all plastic operations on the penis it is much safer to divert the urinary stream, a catheter was inserted into the bladder through a trocar and canula. There was never any leakage around the suprapubic tube and the wound on the penis healed firmly, so that after removal of the suprapubic catheter all the urine was passed at the terminal point of the new urethra and there were no fistulous openings.

FIGURE II.
The appearances after operation (anterior view). Note the position of the right testicle.

The third stage was postponed till November, 1936, so as not to interfere with his school work, and at this time the third stage was completed. The accompanying figures show the final result.

Reviews.

OSTEOPATHY.

IN their book, "What is Osteopathy?" Dr. Charles Hill and Dr. H. A. Clegg attempt to answer a question that is unanswerable, because even the disciples of Andrew Still, the founder of the cult, themselves supply conflicting answers to the question.

The authors have done a service in carefully analysing the claims of osteopathy to be regarded as a scientific system of medicine and in showing that "the theory of osteopathy is based not only upon insufficient evidence, but upon insufficient knowledge of what must be the basic sciences of any system of healing which claims to be scientific".

Andrew Taylor Still was born in Virginia in 1828 and died in 1917. The son of an itinerant preacher, he received little formal education, but was apparently blessed with a vivid imagination, examples of which are quoted from his "Autobiography" in Chapter I. Still himself, in referring to the "discovery" of osteopathy, stated that, in 1874:

[1] "What is Osteopathy", by C. Hill, M.A., M.D., D.P.H., and H. A. Clegg, M.A., M.B., M.R.C.P.; 1937. London: J. M. Dent and Sons, Limited. Demy 9mo, pp. 237, with illustrations. Price: 7s. 6d. net.

> Twenty-four years ago, the 22nd of next June, at ten o'clock, I saw a small light in the horizon of truth. It was put into my hand, as I understand, by the God of Nature. God is the Father of Osteopathy and I am not ashamed of the child of His mind.

As a divine revelation, the tenets of osteopathy are, and must be, immutable to the true disciple. Those tenets were set out in Still's original platform, and briefly are as follows: (i) that disease is the result of anatomical abnormalities followed by physiological discord, and to cure disease the abnormal parts must be adjusted to the normal; (ii) that osteopathy is an independent system and can be applied to all conditions of disease; (iii) that drugs and other therapeutic agents are excluded from the scope of osteopathy, the body being all-sufficient and supplying its own remedies.

On these original pronouncements Still built up a queer and nonsensical system of physiology and pathology based on the theory that all disease results from the "osteopathic lesion" which he defined in the following words: "I mean by bony lesions a sufficient strain or dislocation to produce pressure and obstruct the normal discharge of nerve and blood supply." This pressure was mainly the result of dislocated ribs, hips and spinal joints.

The osteopath of today appears to pin his faith to dislocations of the spine as the root of all disease (in "The Scientific Basis of Osteopathy", published in 1935, lesions of the thirteenth thoracic vertebra are described); but Still was more catholic in his outlook, and the dislocated hip played a large part in his theory and practice. "When a hip", he wrote, "is thrown out of the socket . . . is it at all surprising to say that this accounts for many diseases—such as hysteria, confused menstruation, constipation, bladder and kidney disease . . .". As the authors amusingly remark: "A dislocated hip is not the sort of thing you take to bed with you with any degree of equanimity", and yet, "According to Still, dislocated hips were common . . . Constipation, it is true, is common and it is conceivable that a patient with a dislocated hip might prefer to be constipated until the dislocation was reduced."

The "lesion" with the passage of the years has been defined in many ways, and after traversing its history, the authors remark:

> It has in its time played many parts; a dislocated hip, a twisted rib, a dislocated spine, a contracted muscle, a fixed joint, a strained joint. It presses and it does not press. It is swollen and it is contracted. It can be demonstrated by X rays and it cannot be so demonstrated. It has been seen post-mortem and it has not been seen post-mortem. It is as difficult to define as personality and infinity, and as easy to define as a strained ankle.

Had the osteopaths remained true to their simple faith, they might have been as successful as the Christian Scientists; but, unfortunately for themselves, they endeavoured to find scientific proof for their assertions and published "Bulletins" from the A. T. Still Research Institute. The authors quote some of the remarkable experimental results detailed in the "Bulletins" and conclude that "whatever there may be in osteopathy, no scientific evidence in support of its contentions has yet been presented". Free use is made of the report from the select committee of the House of Lords, which considered the Registration and Regulation of Osteopaths Bill in 1935, and it is interesting to read the minutes of evidence given to that committee by Dr. Kelman Macdonald, a legally qualified medical practitioner who practises as an osteopath. Torn between his loyalty to Still's theories and the facts acquired in a scientific training, Dr. Macdonald admitted that he would use certain drugs in the treatment of disease, including insulin, emetine, alkalis, strophanthin, morphine and adrenalin—a long stride from the edict of A. T. Still, that "he who so far forgets God's teaching as to use drugs forfeits the respect of this school and its teaching".

The claims of the osteopathic training schools to rank with orthodox medical schools are examined and the authors have no hesitation in agreeing with the opinion expressed by the House of Lords committee:

> The only existing establishment in this country for the education and examination of osteopaths was exposed in the course of evidence before us as being of negligible importance, inefficient for its purpose, and, above all, in thoroughly dishonest hands.

Mr. H. G. Wells, in his preface to the book, suggests that the medical profession "might respond much more generously and effectively to the common desire to know what is being discovered, what is being practised and why"—a suggestion that might well be heeded. While urging the profession "to take unto itself . . . whatever good there is in manipulative healing", he outspokenly says that "osteopathy considered as a system of medicine or as anything more than the manipulative side of surgery is impudent 'balderdash' ".

There are several illustrations in the book, some of them not particularly apt; but readers will appreciate the X ray photographs of Dr. Hodgson's butler, before and after drinking beer, which were demonstrated to the select committee to refute the osteopaths' claims that œdema in the region of the spine was the basis of the osteopathic lesion.

Like the man in the popular song, osteopathy is dead, but it won't lie down. This book should materially hasten the decent interment of the corpse.

THE PROFESSION OF NURSING.

IN the remarkable transition from the primitive institutions for harbouring the sick, prevalent only seventy-five years ago, to the order and cleanliness of the modern hospital and the efficient care of the sick, tribute must be paid to the part played by the nursing profession in creating the technique and establishing the standards of modern nursing care.

The monograph, "Nursing as a Profession", by Miss Esther Lucile Brown, of the Department of Statistics in the Russell Sage Foundation, is one of a series dealing with the present status of certain established or emerging professions in the United States of America.[1] Nursing is considered as an emerging profession, still struggling under the difficulties of differing standards of teaching in the 1,844 nursing schools scattered throughout the United States of America. The various national associations for the improvement of nursing have recently formed a joint committee in order to formulate a more satisfactory and better coordinated plan for training nurses and for offering nursing service throughout the country.

The very uneven distribution of nurses over the various States and the difficulty in some quarters of obtaining nursing aid, while in others many fully trained graduates are unemployed, indicate how necessary is some such central committee. The study deals with other problems facing the nursing profession—problems common in this country as well: unemployment in certain areas and its relation to the vast number of student nurses graduating every year (26,000 in 1931); the salaries of nurses; the inability of people of the large middle class to pay the fees for requisite nursing service; the educational standard of entrants to training schools, and the standardization of training provided throughout the country. The monograph is comprehensive and well set out with statistics and tables to illustrate the position. It should be useful to those interested in more closely linking the nursing services in Australia, and shows how desirable is the standardization of nursing training as a national, and not merely as a local matter.

[1] "Nursing as a Profession", by Esther Lucile Brown; 1936. New York: Russell Sage Foundation. Large crown 8vo, pp. 120. Price: 75c. net.

The Medical Journal of Australia

SATURDAY, SEPTEMBER 18, 1937.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

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Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE MEETING OF THE FEDERAL COUNCIL.

TWICE every year the Federal Council of the British Medical Association in Australia holds a meeting, the proceedings of which are always recorded in this journal. The average Branch member who takes the trouble to read the reports of the meetings may not appreciate the thought, time and care that are given to the matters on the agenda paper, nor the significance of decisions made. Even the most casual member of the Association, however, must realize that the medical profession in Australia is facing most difficult problems. These problems affect the practitioner in his everyday life, in his interprofessional relationships, and in his service to the community; they cannot be avoided, but must be faced with determination and understanding. When, therefore, we state that the meeting of the Federal Council held recently in Adelaide and recorded in this issue was one of the most important in its history, the account of the meeting will surely receive the careful attention of every member of the Association.

During the last two or three years it has become more and more apparent that the Branches of the British Medical Association in Australia need a central organization which is thoroughly conversant with medico-political problems as they affect the several States, and which will be able to act without delay when emergency arises. For more than fifty years the British Medical Association has been the bond of union between practitioners in the several States of the Commonwealth and the Parent Association. With the formation of the Federal Committee the Australian Branches became united; they established the Australasian Medical Congresses and also the Australasian Medical Publishing Company, Limited, which controls THE MEDICAL JOURNAL OF AUSTRALIA. But, as has often been pointed out in these pages, the Federal Committee was merely a consultative body—it had no executive power. It was superseded by the Federal Council, a body empowered to take action on behalf of the Branches as a whole. Always, however, the individual Branches, then the Federal Committee, and later the Federal Council have had to submit to the Council of the Parent Body for its approval any new by-law, any proposed alteration in a rule or any ethical principle that they wished to establish. Delay was often inevitable and not infrequently irksome. Dr. J. Newman Morris made this quite clear in the remarks at the recent meeting of the Federal Council. In the opinion of many prominent members of the Association in Australia the present arrangement has outlived its usefulness, and it was not surprising that the Council should adopt a resolution, according to which consideration will be given to the possibility and desirability of forming an Australian medical association in affiliation with the British Medical Association. When individual members of the Branches and when Branch Councils consider this proposal, they should bear in mind the restrictions occasioned by the present nexus between the Australian Branches and the Parent Body and also the urgent need for

freedom of action resulting *inter alia* from the present trend of legislation in both States and Commonwealth. They should further remember that no disloyalty either to the British Medical Association or to its aims and objects is implied in a desire to form an association controlling its own destinies. Parents must expect that children who have set up their own establishments, especially if they are far from the parental roof, will wish to be free to control their own actions; filial love and allegiance are not inconsistent with freedom of action.

Two other matters of importance dealt with by the Federal Council were national insurance and the intention of the Government of Tasmania to install medical officers in sparsely populated country districts. In both these matters the Council had as its chief objective the provision of a satisfactory service for the public. The details of service under a national insurance scheme were discussed only because it was thought that the President might be called on, as the mouthpiece of the profession, to indicate its views regarding ways and means. The Council offered to the Government of Tasmania the services of its General Secretary, Dr. J. G. Hunter, because of his wide knowledge of the conditions of medical service in Australia and because of its desire that the people of Tasmania should have an efficient health service. It is to be hoped that the Premier of Tasmania and the Minister of Health, who is a medical practitioner, will accept the offer of cooperation.

Current Comment.

ADHESIVE CONSTRICTIVE PERICARDITIS (PICK'S DISEASE).

THERE are two forms of adhesive pericarditis. In adherent mediastino-pericarditis there are cardiac adhesions to the diaphragm or thoracic wall. This is the better known type of adhesive pericarditis. In the other form there are constricting adhesions over the vessels and cardiac chambers. In this constrictive form the passage of blood from the veins and auricles to the ventricles is hampered. The operation of pericardial decortication has been performed in a few cases for chronic constrictive pericarditis with a rather large proportion of operative fatalities; but the condition of more than half of those patients who survived was considerably improved. In the operation the pericardium is freely exposed, part of its anterior surface is removed, and constricting bands about the great vessels are divided. An account of constrictive pericarditis has been given by H. V. Cranfield, N. B. Gwyn, G. C. Anglin and A. C. Norwich.[1] They state that adhesive constrictive pericarditis may be termed a newly recognized form of cardiac disease. It has been designated Pick's disease, and also mediastino-pericarditis, *concretio pericardii* and, when associated with thickening of the capsule of the liver and spleen or with chronic peritonitis, pericarditic pseudo-cirrhosis. The essential feature is implication of the pericardial layers in a fibrosing, adhering form of pericarditis, sometimes affecting the visceral layer of the pericardium. The inflow from the great veins to the auricles is obstructed. Expansion of the cardiac chambers in diastole is restricted. The coronary circulation is compressed. Hypertrophy of the labouring heart is prevented, and consequently the heart remains small. Pick's disease differs conspicuously from the usual type of adhesive pericarditis, in which hypertrophy results from adhesion of the parietal layer of the pericardium to the chest wall and neighbouring structures. Cardiac systole is hampered and enlargement follows, with such manifestations as systolic indrawing of the precordia and tugging at certain points of the diaphragm's attachments (Broadbent's sign). Cranfield and his colleagues consider that no definite line can separate the end results in cases of chronic thickening of the pericardium and of its adjacent structures. It can be inferred that in chronic constrictive adhesive pericarditis the progressive thickening and shrinking of the outer and inner layers of the pericardium must begin to constrict the heart early, and must outdistance such changes as are happening in the tissues immediately outside and around the heart and pericardium. Thus Pick's disease, with fibrosing, contracting pericarditis, is an inflow stasis as compared with the condition of affairs in hearts enlarged as a result of adhesions between the pericardium and external structures. The inflow stasis is due to two causes: constriction about the orifices of the great veins and restriction of diastolic expansion of the auricular and ventricular chambers. Dilatation of the heart is impeded by the mechanical pressure exerted by the constricting pericarditis. Hypertrophy is impaired because interference with the coronary circulation takes place. Eventually there results a condition of cardiac compression, which is often precipitate in its onset, just as in the more easily recognized acute constrictive compression due to sudden accumulation of blood or other fluid in the pericardium. C. S. Beck has described a triad of physical signs in both acute and chronic forms of compression. In the acute form effused blood in the pericardium, pressing on the heart and veins and interfering with the mechanism of the heart, determines the first

[1] *The Canadian Medical Association Journal*, May, 1937.

compression triad—falling arterial pressure, rising venous pressure and a small quiet heart. With falling arterial pressure there are associated anxiety, restlessness, pallor, cold moist skin, weak pulse, unconsciousness and death, unless the venous pressure is quickly relieved. In chronic cases the triad generally noted consists of high venous pressure, ascites and again a small quiet heart. If the rise in venous pressure extends over a period of years, death will not ensue until the pressure exceeds 38 centimetres of water; that is, twice the amount against which the heart can work when compression is rapid in onset. Venous stasis, noted in the veins of the neck, which do not empty with inspiration or with the erect posture, eventually causes an exudate to appear in the abdominal cavity and this exudate has a high fibrin content. This high fibrin content produces the frosted liver and spleen, which are not due to infection.

Cranfield and his colleagues discuss the various operative measures employed for the removal of cardiac compression and refer to an additional series of fifteen cases of adhesive constrictive pericarditis recorded by P. D. White in 1935. Diagnosis was confirmed by operation in twelve cases, by autopsy in one and in the remaining two by clinical observation with X ray investigation. Ætiologically the causes were assigned in two cases to tuberculosis, to polyserositis after pneumonia in two instances and to mediastinal sepsis in one. In the other ten the cause was not determined. White emphatically asserts that no cases were due to rheumatic fever.

Cranfield and his associates give full details of another case. They consider that the prognosis, without surgical treatment aiming at freeing auricles and ventricles from constriction, is unfavourable for health and often for life. The article by Cranfield and his associates is a distinct addition to our knowledge of a little known condition.

THE INTERPRETATION OF GORDON'S TEST FOR LYMPHADENOMA.

HODGKIN'S DISEASE or lymphadenoma is not a common disease, but it really cannot be considered uncommon. Its exact diagnosis is of great importance. In recording some of the special work done under the Rose Foundation, Gordon paid a tribute to the accuracy of the clinical diagnosis in the cases he studied, checked as it was by histological studies. But clinical exactness is only relative, and there is a definite margin of error, as there is also in the histological methods, for the tissue available may not show distinctive changes. Workers in cancer research and treatment are specially insistent on this need for checking the accuracy of the clinical diagnosis, and Hodgkin's disease, whatever may prove ultimately to be its true nature, certainly has affinities with malignant disease. The purpose of these remarks is to emphasize the need for being as sure as possible when a diagnosis of lymphadenoma is made, for the prognosis appears to be steadily improving with the adoption of modern methods of radiation, provided treatment is begun at a reasonably early stage. Gordon's test, as is well known, is a biological test. Gordon found that an emulsion of the affected glands when injected intracerebrally into rabbits caused a characteristic encephalitis, a reaction which was apparently specific. Friedemann then demonstrated that similar results could be obtained from emulsions of bone marrow, leucocytes and spleen tissue; and other workers agreed that the encephalitogenic agent present in certain normal tissues was indistinguishable from that found in the lymphatic glands in Hodgkin's disease. Gordon thought that the behaviour of this agent strongly suggested the presence of a virus, but this is very doubtful, since the encephalitis in laboratory animals cannot be passed from one to another, and immunity does not appear to be conferred on the affected animals. Gordon and Coles have since found certain elementary bodies in the affected glands, and treatment by a vaccine prepared from these glands has been attempted. This is reminiscent of the interesting results published by L. Utz and the late Leila Keatinge in this journal some years ago, when they reported encouraging results following the use of an immune serum prepared from chickens. All these interesting steps in the attempts to unravel the mystery of Hodgkin's disease are briefly recounted by C. E. Van Rooyen in a review of 100 cases in which the value of Gordon's biological test was studied.[1] Van Rooyen further points out that histological examination is not so exact as might appear at first sight. Even if one could be sure that truly representative portions of tissue were supplied to the pathologist, there would be no definite or clear-cut tissue picture which would describe all cases. The late Professor Kettle, who collaborated with Gordon in his work, suggested the use of the term "Hodgkin group" to include all types of case on which biopsy reports are to be made. Van Rooyen has found in his series that the help given by Gordon's biological test is very welcome, and that the test shows a percentage of error which is very small, and compares favourably as regards accuracy with other standard laboratory aids to diagnosis.

It is pointed out that the results obtained by splenic tissue and bone marrow in no way invalidate the test, for it is intended to be carried out only with the tissue of enlarged lymph glands. Further, other glandular enlargements such as those found in tuberculosis, syphilis or blood dyscrasias give no result with the Gordon test. Van Rooyen has found that all glands do not contain the encephalitogenic agent in equal amounts; one gland may fail to give a reaction while another gland from an adjacent or different part may yield a positive result. Van Rooyen has noticed that the glands which show the fibrosis characteristically seen

[1] *Edinburgh Medical Journal*, July, 1937.

where the disease process is well advanced, may not yield so satisfactory a result to the test. Only pathologists will be concerned with the more intimate details of this test and its relations to the histological findings, but nobody at all interested in cancer problems can fail to be interested in the recent work on this puzzling disease. Is it a virus infection as a number of authorities still believe? And does the work done by Utz and Keatinge and more recently by Warner on treatment by immunological methods rest on a sure basis? Or is the disease really neoplastic, as the majority of writers seem to think? In this case, are the successes of the radiotherapist due to the sensitivity of a particular form of neoplasm to radiation? These questions, together with others even more obscure, such as the remarkable cycles of pyrexia and the curious and rapid waxing and waning of the lymphadenomatous swellings, are not yet solved. But it is important that a correct diagnosis should be made as early as possible, and that when every facility for a biological test is not available a biopsy should be carried out wherever it is readily possible, in order that all available information may be obtained and that knowledge may grow.

THE IMPORTANCE OF CARDIAC NEUROSIS.

"EVERY patient with cardiac symptoms or signs or with knowledge of heart disease in family or friends is a potential cardiac neurotic." These words are taken from an article on the growing importance of coronary neurosis by Paul D. White and R. Earle Glendy.[1] Paul White is sufficiently known as a cardiologist for such a statement to carry great weight, and the truth of this aphorism will be admitted by all practitioners of medicine whose interests are in any way concerned with the condition of the circulatory system. At the present time this whole question of the risk of increasing the incidence of neuroses by such publicity as health talks on the radio and special articles in the popular Press is one which has concerned all people interested in public health. On the one hand it is, of course, vitally necessary to give the public such information as will enable them to aid in the detection of disease in its earlier stages, but, on the other hand, it is not difficult to implant fear in the minds of more nervous members of the community instead of that calm unawareness of bodily function which is one of the greatest blessings of health. Heart disease, as these authors point out, has assumed almost first place in our practice, but the condition which they describe is that of a neurosis either in the person who has a normal heart or in one who is already a subject of heart disease. They do not refer to neuro-circulatory asthenia, for this is not a mental state, but rather to a condition of fear and apprehension about the state of the heart. There is naturally always some definite exciting factor in these cases, and this may be the reading in a newspaper of a sudden death of a celebrated person, or the hearing of the sudden death of a personal friend, or the consciousness that the patient has some disturbance of cardiac rhythm, or the finding by a physician of a murmur or hypertension and some other abnormality in the circulation. To this list of White and Glendy we should add another cause which is aready important in this community, and that is the belief on the part of the patient that he has injured his heart in the course of his daily work—a belief which may be encouraged or even inspired by an erroneous diagnosis such as that ancient fallacy "a strained heart". The subjective sensations which initiate the trouble may be purely functional, such as sighing respiration or symptoms of neuro-circulatory asthenia; or they may be organic in nature, though relatively unimportant, such as those arising from extrasystoles or bouts of tachycardia, or pain due to known cardiac causes; but, of course, they also may spring from the symptoms of genuine cardiac disease. Everyone will agree with the authors that the most difficult cases are those of patients whose already serious heart disease is complicated by an accompanying neurosis. An example is not infrequently seen in a patient who has had a coronary occlusion, and who, even after making a complete recovery, is thereafter plagued by an incessant apprehension. An excellent example of this is quoted in this article, the patient being a powerful and active man, incidentally a physician, who had a characteristic coronary occlusion. Four months after this he felt very well, but was so nervous that he was afraid to be alone, and insisted that his wife should constantly accompany him. He entertained a very gloomy point of view about his future, and regarded himself as crippled for life. Examination revealed that he had made a very good recovery, as evidenced by the response of his heart to an average easy life, and also by fluoroscopic and electrocardiographic examination. After reassurance, it was possible to induce him to resume much of his former activity, with the result that he remained well over a period of two and a half years. In another instance compensable heart disease was discovered while the patient was in the army. A man, who was aged twenty-nine years, contracted influenza and following this illness rheumatic valvular disease was discovered. He was given a medical discharge and a pension. A year later he began to have attacks of anginal pain which were not quite typical, inasmuch as they originated mainly in the region of the cardiac apex and were not associated with aortic disease, as is usual with patients of this type who have angina. Injection of the left dorsal sympathetic ganglia with alcohol was carried out in an attempt to relieve these attacks of pain, but although anæsthesia over the left side of the chest was achieved, the patient remained unrelieved. In this case the truth appeared to be that the man had definite organic heart disease in which some discomfort due to the

[1] *Annals of Internal Medicine*, May, 1937.

thumping of a much enlarged heart was to be expected, but which caused an abnormal reaction. An interesting feature of his history was that at one stage the patient's pension was withdrawn and the pain immediately became worse. Another instructive case is that of a man, aged thirty-seven years, whose father and mother both suffered from coronary disease. He had complained over a considerable period of time of breathlessness and palpitation, but had been reassured by many physicians that his heart was normal. However, on one occasion one doctor told him that he had *angina pectoris*, and this scared him badly, so that he resigned from his occupation and returned home. He was enabled to resume activity after complete reassurance had been given as to the absence of organic disease; but later on he discovered a few nævi on his skin about which he was greatly worried, as he had read of spots appearing in the skin in certain forms of heart disease. It may be mentioned that this man's father was a doctor, and he thus had ready access to medical literature.

These cases are striking examples of the commoner forms of coronary neurosis with and without organic disease, and it should also be noted that the authors, in perfect fairness, have quoted another patient who was undoubtedly a psychoneurotic and who had been a morphine addict, in whom extensive coronary sclerosis was eventually found *post mortem*. This man was known to have had myocardial disease, but some of his medical advisers considered that much of the pain he complained of was of nervous origin, though on reading the whole case history through it would seem that he had ample reason for having severe and genuine pain. Cases such as this sound the warning not to be over-enthusiastic about diagnosing a neurosis, for it is always essential to pay all attention due to a known or possible organic disease. But it is more important that nervous people should be saved from becoming invalids where it is unnecessary. White and Glendy think that cardiac neurosis is increasing in frequency, and that it is probably missed more often in diagnosis than that of any other affection concerning the heart. The greatest care should, therefore, be taken not to exalt unduly the importance of some unusual detail in an X ray film or in an electrocardiogram, not to pay too much attention to a cardiac murmur, or to attribute discomfort in the chest to the heart except when there is good reason for so doing.

PHENOBARBITONE IN PARKINSON'S DISEASE.

The manner in which barbiturates are thrust upon patients, whether such medication is appropriate or not, may be calamitous. In Parkinson's disease lack of sleep may be a most distressing feature, and barbiturates may be, and often are, administered to alleviate that condition. Eugene and Esther S. Ziskind, however, issue a warning against the use of phenobarbitone (and probably other barbiturates) in the treatment of Parkinson's syndrome, whether following encephalitis or degenerative or arteriosclerotic in origin.[1] They state that, in error, a patient suffering from chronic encephalitic Parkinsonism was given, thrice daily, 0·1 gramme of phenobarbitone instead of hyoscine. Within four days he was bedridden, with such rigidity that the body could be moved as if made of one block. This extreme rigidity rapidly subsided on discontinuance of the phenobarbitone. Another patient exhibited conspicuous rigidity under phenobarbitone therapy, with amelioration on removal of the barbiturate. Eugene and Esther Ziskind thereupon administered the drug in three cases of Parkinson's disease for the express purpose of observing its effect on rigidity. Four of the five cases are reported in detail and the authors express the opinion that phenobarbitone is contraindicated in Parkinsonism. They insist that the possibility of aggravating the rigidity with moderate therapeutic doses demonstrates the undesirable nature of the drug in all types of the syndrome. As Eugene and Esther Ziskind state, the barbiturates are often termed "brain stem hypnotics", but there is still much controversy concerning the predilection of this group for the basal nuclei of the brain. There are many references in the literature to an affinity of the barbiturates for the central nervous system and even the basal ganglia. A condition known as post-barbital Parkinsonism has been described as a symptom of barbiturate overdosage. E. and J. Keeser, in 1927, demonstrated by experiment the presence of barbiturates exclusively in the thalamus and *corpus striatum*. T. Koppanyi and his associates (1934) obtained barbiturates from every part of the nervous system as well as from other organs. In 1935 the Keesers insisted that, whereas Koppanyi and his associates employed large amounts of the drugs, it was necessary that small doses should be employed to demonstrate selective affinity. Considering these divergences of opinion, the Ziskinds very pertinently state that in Parkinsonism, when the basal ganglia are already diseased, it is easy to imagine an aggravated disability resulting from drugs acting upon the same nuclei, whether these drugs also act on other parts or not. M. B. Hodskins and P. I. Yakovlev have referred to a terminal stage of physical deterioration, which they term neurosomatic deterioration, in epilepsy, with the Parkinsonian syndrome as the main feature. Eugene and Esther Ziskind speculate to what extent this manifestation may be due to protracted use of phenobarbitone in epilepsy. They further suggest that if phenobarbitone has a specific effect on the mechanism of plastic rigidity and not on other forms of rigidity, the barbiturate may be a diagnostic aid to identify early Parkinsonism when diagnosis is very difficult. Finally they speculate as to whether physiological antidotes to the barbiturates may not be efficacious in treating that type of rigidity. Altogether this is a most interesting communication.

[1] *The Journal of the American Medical Association*, July 3, 1937.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Susceptibility of Swine to the Virus of Human Influenza.

R. E. SHOPE AND T. FRANCIS, JUNIOR (*Journal of Experimental Medicine*, November, 1936) have inoculated swine six to fourteen weeks of age with strains "PR 8" and "WS" of human influenza virus, the dose being 6·5 cubic centimetres of 10% infected mouse lung in saline solution, instilled into the anterior nares without anæsthesia. The infection resulting was mild, and the lesions at autopsy were a bronchiolitis, capillary congestion and a mononuclear infiltration of small areas of lung tissue. The virus was recovered by mouse inoculation from affected areas of lung, which were also proved bacteriologically sterile. A further group of swine was inoculated with virus and a strain of *Hæmophilus influenzæ suis*. In the majority the illness was more severe and the fever higher than that produced by the virus alone. At autopsy the lesions were more widely spread and more pronounced, and a confluent pneumonia was produced in affected lobes; the infiltrating cell was polymorphonuclear. Infection by contact between swine inoculated with human virus and normal swine took place in only one of four attempts. Cross-immunity experiments with antisera proved that the virus recovered was the human strain and not an accidentally introduced swine strain. The experiments confirm the fact that swine are susceptible to human influenza virus, and that the illness is more severe quantitatively when *Hæmophilus influenzæ suis* is also inoculated; if the bacillus fails to become established, the mild form of the disease continues. The control of the virus used was in all cases successful.

Dick Toxin in Puerperal Infections.

M. KENNY AND L. COLEBROOK (*The Journal of Pathology and Bacteriology*, January, 1937) have extended their studies with Dick toxin in puerperal women. Of 100 patients with infections with the hæmolytic streptococcus, 19 gave positive skin reactions and 81 failed to give reactions with the Dick toxin. There were 20 deaths amongst those who did not react. Several of those who died had symptoms of general peritonitis, so that ability to neutralize the Dick toxin is no criterion of susceptibility to puerperal infection with the hæmolytic streptococcus. Twelve who failed to react had a terminal scarlatiniform rash. The tests were repeated at varying intervals during convalescence, but the results were constant; there was no instance of a positive reactor failing to yield a reaction as her infection was overcome. Peritoneal exudates recovered at autopsy from the two fatal cases of peritonitis were shown to contain considerable amounts of Dick toxin, and produced sharp reactions in "Dick-positive" subjects, in one instance producing a febrile reaction. The experiments did not lend any hope that immunization of pregnant women to Dick toxin or that the prophylactic use of antitoxic serum would lead to any diminution of puerperal infection with the hæmolytic streptococcus. The fact that it is impossible to protect animals with such a serum given after intraperitoneal infection is established does not lend much hope that antitoxic sera will be of use in treatment. Previous experiences had indicated that in some cases in which patients were treated with antitoxic sera or antistreptococcus serum there had been a higher mortality than among those not so treated, so that it would be wiser to withhold serum from all patients infected with the hæmolytic streptococcus.

Hæmophilus Pertussis in Mice.

F. M. BURNET AND CECILY TIMMINS (*The British Journal of Experimental Pathology*, April, 1937) have produced experimental infection by intranasal inoculation of mice with *Hæmophilus pertussis*. Recently isolated cultures grown on Bordet-Gengou medium and emulsified in broth were used, the dose being 0·05 cubic centimetre, administered under ether anæsthesia. The technique is fully described and the necessary precautions are stated. With the average dose death occurred in a few days, and the *post mortem* appearances of the lungs were somewhat comparable with those seen in mice dying from experimental influenza virus infection. The colour, however, was lighter, and the areas affected were more scattered, giving a more mottled appearance. Cultures from the cut surfaces of affected areas were always positive for *Hæmophilus pertussis*, though sometimes the number of secondary invaders was great and might overgrow the organism inoculated. Smaller doses might take as long as ten days to kill the mouse, but would still be attended by positive culture, indicating a true infection and that death was not merely due to the toxic effects of the bacterial products. Histological preparations showed cellular infiltration and œdema of the alveolar walls by polymorphonuclear leucocytes and mononuclear cells, and clumps of bacilli could be seen. The bronchiolar epithelium showed characteristic changes, denudation of the ciliabearing surface, proliferation of the cells, and much activity of the goblet mucus-secreting cells. The tracheal mucous membrane was much less affected. Mice were found to be immunizable by intraperitoneal injection of living cultures or formalinized cultures. Intranasal inoculation by the technique described demonstrated protection in these immunized mice. These mice, killed at the end of the period, did not yield positive cultures. The method is described as being of possible use for the standardization of vaccines of antigenic value for the prophylaxis of whooping cough in children.

Dysentery in Infants and Children.

EDITH HAYNES (*Journal of Infectious Diseases*, March-April, 1937) has made a bacteriological study of forty cases of clinical dysentery. Specimens were taken by proctoscopic examination and swabbing of reddened mucosa. Protozoans were constantly looked for and found only once in a child of twenty months, the organism being a trichomonas. Flexner bacilli were obtained on culture in thirteen cases, Sonne bacilli five times in the series. Paradysentery bacilli were not found in any of the other cases. Agglutination tests were carried out on the patients' serum with the homologous organism and with standard strains, and only five positive results were obtained; three were under a titre of 1 in 100. It was thought that the agglutination test had no place in the diagnosis of bacillary dysentery. Blood cultures were taken in only two of the cases, shortly before death, and in each instance a pure culture of Flexner bacilli was obtained. All the Sonne infections were clinically mild; the Flexner infections were more severe, all five deaths being due to this strain. The author concludes that the Sonne infection is a mild one, and that many affected persons may not apply for medical treatment; the Flexner form is more severe and has a comparatively high mortality rate.

Subcutaneous Smallpox Vaccination.

EDUARDO GALLARDO AND JULIO SANZ (*American Journal of Hygiene*, March, 1937) have continued their work with vaccinia virus on subcutaneous vaccination. The original work showed that complete immunization resulted and also showed an absence of complications inherent in the formation of the cutaneous pustule. Cultivation of the virus was carried out according to Rivers's method and was found to maintain the virulence of the strain as tested on rabbits. The vaccine was prepared by taking the sediment from the culture flask, triturating it, adding one-third of the fluid left in the flask, and using serial dilutions of the mixture. For primary vaccinations 0·2 cubic centimetre of a one in ten dilution and for repeat vaccinations 0·4 cubic centimetre were found to be suitable dosages. Cultivation on the chorio-allantoic membrane of the chick was also carried out successfully, each membrane being ground with 5·0 cubic centimetres of normal saline solution and diluted as in Rivers's method; similar dosages were used. Filtration of fresh calf lymph was also attempted, and success was obtained with the method of Lemos Monteiro and Raul Godinho. This material was also used for primary vaccinations and revaccinations. The

virus was conserved at −10° C. Room temperature caused a loss of activity, and 72 hours at 37° C. caused complete inactivation. Some vaccine was dried, and this also was tested. The vaccine was prepared by the three methods, and dried portions of each were then used on a series totalling 8,960. It was found that the incubation period was inclined to be irregular in the primary vaccination, usually being between five and ten days, but occasionally taking as long as twenty days. A reddened infiltrated area appeared around the site of subcutaneous inoculation; this led to the formation of a subcutaneous nodule which was slow to resolve. Axillary gland involvement was rare. Slight temperature reactions were sometimes observed, but not of a severe degree; 90% of "takes" were obtained with all forms of virus used. The immunity obtained was found to be as lasting as that obtained by the ordinary cutaneous vaccination. In the small proportion of children in whom the subcutaneous method did not seem to have taken, on revaccination with the cutaneous method a certain degree of immunity was found to have been produced, in that only a modified reaction was obtained to the second vaccination. No complications occurred in the series.

HYGIENE.

The Relationship Between Yaws and Syphilis.

T. B. TURNER (*American Journal of Hygiene*, May, 1937) has studied the relationship between yaws and syphilis. The studies were conducted in Jamaica, Haiti and Baltimore with the support of the International Health Division (Rockefeller Foundation). Distinct differences were found which cannot be explained by differing circumstances, such as race, age of infection, portal of entry, social and economic status. Yaws is limited sharply to tropical climates (and the tropical zone). Syphilis is world-wide, except possibly where yaws is present. Apart from its acquirement in childhood and the initial extragenital lesion, characteristic lesions develop in yaws. Papules up to large confluent fungating masses are found, the convoluted surface resembling a raspberry (frambœsiform). Plantar lesions are either the infective plantar papule, a very sensitive ulcerated papule, from which *Treponema pertunue* is readily obtained, or hyperkeratosis. Partial desquamation leads to a moth-eaten appearance of the sole. Usually lesions persist for long periods with abundant treponemes present, and relapses may occur even ten years later. Yaws is not only limited to the tropics, but is even sharply limited to certain local areas. Wherever it was common, the district had a heavy rainfall and a fertile moisture-holding soil, the rural areas showing a higher prevalence than the towns. It is suggested that some environmental factor operates, for example, flies of the *Hippelates* genus acting as a reservoir. In Jamaica the distribution of these flies and the cases of yaws was striking. Syphilis is not associated with any but human factors. Over 90% of yaws infections had developed before fifteen years of age, and in only 1·1% was the initial lesion on the genitalia. Syphilis is rarely acquired in children, and in negroes only 7·2% of primary lesions were extragenital. Iritis and meningitis are not uncommon in Baltimore, though not observed in Jamaica. On analysis these factors of age, portal of entry, social and economic factors, do not account for the differences in the lesions. Nor is climate a dominant feature, as syphilis and yaws exist side by side in Jamaica. No case of neuro-recurrence was noted in the yaws cases. Authentic cases of simultaneous early infections of yaws and syphilis in the same patient have been recorded. Rabbits inoculated with treponemes from cases of yaws and of syphilis developed characteristically different lesions. The ability to produce these was not lost upon serial passage over three years. The pathogenic properties of the two treponema are distinct and the differences noted in the disease as affecting man are due in part at least to inherent differences in the causative agent of each disease.

The Compensation Aspect of Industrial Hygiene.

WESLEY M. GRAFF (*American Journal of Public Health*, July, 1937) states that in Massachusetts the compensation insurance rate is 5 dollars per 100 dollars of pay *plus* 300 dollars per year for each employee. In five years 92 pneumonokoniosis cases cost 3,131 dollars a case. Allowing ten years for many employees to develop the disease, it was considered necessary to collect 3,000 dollars per man over that period. Control of occupational disease is necessary.

The Ascorbic Acid Content of Milk.

E. J. REEDMAN (*Canadian Public Health Journal*, July, 1937) states that samples of milk from four breeds of dairy cows collected during November showed little variation of ascorbic acid content, whether between breeds or between individual animals, or in various stages of lactation, or with the age of the cattle. The total output of ascorbic acid varied according to the quantity of milk produced. The grass hay and silage varied greatly in ascorbic acid content, but milk acts like a body tissue, having a saturation point maintained in the healthy animal. Raw milk cooled to 5° C. and stored in the dark retained 75% after forty-eight hours. Reduced ascorbic acid only is found. Milk pasteurized for thirty minutes by the holder method retained over 70%, the highest destruction being 26·5%. Raw skim milk averages 2·5 milligrammes per 100 cubic centimetres, skim milk dried by the drum method 26·7 milligrammes of ascorbic acid per 100 grammes. On an average, a pint of milk may contain 10 milligrammes after pasteurization. Though it does not supply all the ascorbic acid required, it forms a welcome additional supply. For calves the nutritional value of raw milk is the same as pasteurized milk, though the calcium phosphorus content is rendered less available in the latter. The dangers of cold (raw) milk outweigh any objections to pasteurization.

Industrial Sanitation.

T. HATCH (*American Journal of Public Health*, July, 1937) states that measurement of dust concentration is carried out by the Greenburg-Smith impinger. Though efficient, it is bulky and fragile, and the estimation is time-consuming. The real purpose of dust determination is physiological rather than physical—to obtain an index of health hazard. Dusty operations can be classified into four, according to the million particles per cubic foot, 45 ± 25, 35 ± 15, 15 ± 8, 4 ± 2. In sampling, a number of properly spaced determinations are best. Standards of permissible dustiness depend on the circumstances. The South African figure of one milligramme per cubic metre has proved efficient by actual experience of silicosis. The dust, however, may contain in South Africa as little as 20% of free silica, while the minute particles are mainly sericite. Local exhaust systems are mainly used. Microscopic dust is thrown off only two to three centimetres. Convection air currents distribute it. The hood design limited other air motion. To ensure steady flow of all dust-laden air, a minimum velocity of air is necessary, such as 200 feet per minute. Industrial code specifications for hoods are necessary, giving the value of static suction. All-important is the manner in which the dust flows into the hood.

Public Health and the Traffic Accident Problem.

N. L. BURNETTE (*Canadian Public Health Journal*, July, 1937) criticizes the exaggerated safety propaganda and current views of causation. In Ontario 3,000 persons were killed in six years and 52,000 injured. Twenty-six *per centum* of drivers were on the wrong side of the road, 20% drove off the highway, 15% did not have right of way, while 12% could not be classified. Mental and physical factors may be suspected, and sufferers from mental and physical conditions are properly the study of physicians and scientists. More data are required, an epidemiology of accident experience should be built up. Schools form a convenient source of material. The determination of causal factors in an accident is just as important as the accurate filling in of a death certificate. Unsafe driving is as much the concern of the health officer as is unsafe milk.

British Medical Association News.

MEETING OF THE FEDERAL COUNCIL.

A MEETING of the Federal Council of the British Medical Association in Australia was held in the Council Room of the South Australian Branch, 178, North Terrace, Adelaide, on August 19 and 20, 1937, SIR HENRY NEWLAND, the President, in the chair.

Representatives.

The following representatives of the Branches were present:

New South Wales: Dr. George Bell, O.B.E., Dr. L. A. Dey (as substitute for Dr. A. J. Collins).

Queensland: Dr. T. A. Price, Dr. N. W. Markwell (as substitute for Dr. D. Gifford Croll).

South Australia: Sir Henry Newland, C.B.E., D.S.O., Dr. E. Britten Jones.

Tasmania: Dr. S. Gibson, M.C., Dr. W. E. L. H. Crowther, D.S.O.

Victoria: Dr. J. Newman Morris, Dr. F. L. Davies.

Western Australia: Dr. F. W. Carter (as substitute for Dr. D. M. McWhae), Dr. L. E. Le Souef (as substitute for Dr. D. D. Paton).

Minutes.

The minutes of the previous meeting of the Federal Council of January 27, 1937, which had been circulated among members, were taken as read and signed as correct.

The Appointment of General Secretary.

Attention was drawn to the fact that Dr. J. G. Hunter's term of office as General Secretary of the Federal Council would expire on September 30, 1937. In discussing the question of Dr. Hunter's reappointment, Dr. J. Newman Morris pointed out that the grant from the Parent Body of £1,000 *per annum* for three years would expire next year. He drew attention to the increasing difficulty with which the affairs of the several Branches in Australia were conducted. Whenever a rule had to be altered or an ethical principle had to be laid down the matter had to be submitted to the Council of the Association in London. Sometimes the Council approved of the proposed new measure or alteration; sometimes it suggested an amendment. In any case delay was always occasioned and the matter was becoming more and more difficult. For many years it had been felt by many of the Australian Branches that an increasing degree of autonomy was desirable. Dr. Morris also drew attention to the large sums of money which were sent from Australia every year to the Parent Body and voiced the opinion of several of the Branch councils that this money might be more advantageously expended in Australia. He went on to say that in his opinion and in that of many others the time had come when serious attention should be given to the possibilities of the formation of an Australian medical association which would be affiliated with the British Medical Association in much the same way as the Canadian Medical Association was affiliated with the Parent Body. He maintained that the expression of such an opinion did not in any way imply disloyalty to the British Medical Association, for if an Australian medical association was formed it would have the same aims and objects as the British Medical Association and would stand somewhat in the position of a child that was prepared to support himself while owning allegiance to his parent.

A general discussion followed in which many members took part. Sir Henry Newland said that he believed the formation of an Australian medical association to be inevitable, and several members expressed the view that if steps were to be taken in the proposed direction there should be no undue delay. It was, therefore, resolved as follows:

It has become increasingly apparent that the organization of the medical profession in Australia is impeded rather than assisted by reason of the fact that the work is carried on under the Articles and Memorandum of Association of the British Medical Association. This involves frequent reference of important matters for decision to London and the transference of large funds which are required in Australia. The Federal Council, therefore, is of the opinion that the time has arrived to explore the possibilities and desirability of forming an Australian medical association, affiliated with the British Medical Association, and refers the matter to the consideration of the Branch Councils.

That a subcommittee be formed to submit the outlines of a draft constitution of an Australian medical association to the next meeting of the Council.

It was also decided that Dr. J. G. Hunter should be reappointed as General Secretary of the Federal Council for a further twelve months.

Appointment of Assistant General Secretary.

At the previous meeting of the Federal Council it was resolved that the Federal Council should approach the New South Wales Branch with a view to the appointment of an assistant secretary so that Dr. J. G. Hunter might be relieved of his Branch duties as required by the Federal Council. The General Secretary reported that Dr. Hugh Hunter had been appointed Assistant General Secretary.

Annual Report of the Federal Council.

The report of the activities of the Federal Council for the twelve months ended June 30, 1937, which had been circulated amongst members, was adopted.

Finance.

The financial statement as at June 30, 1937, was presented. The statement included the Federal Council account and the Australasian Medical Congress (British Medical Association) Fund Account. The statement was received.

Medical Officers' Relief Fund (Federal).

A report was received from the trustees of the Medical Officers' Relief Fund (Federal). Dr. George Bell stated that at the present time income exceeded expenditure. There was one defaulter on the list and two of those to whom loans had been made were slow in their repayments. The report was received.

Visit of the General Secretary to Queensland.

The General Secretary reported that he had been able to give effect to the desire of the Council to implement its constitution by making an extended tour throughout Queensland and by carrying out organization work on behalf of the Queensland Branch. In order to make himself fully acquainted with the policy of the Queensland Branch and with the problems confronting the Association, he had paid a short visit to Queensland early in April, 1937. He had addressed a meeting of the Queensland Branch Council on April 7 and an extraordinary general meeting of the Branch on April 8. He had returned to Queensland on June 12 and had remained there until July 22. In order to give the members of the Council an idea of the need for greater activity in organization, not only in Queensland, but also in other States, he briefly outlined the policy of the Government of Queensland in regard to the provision of medical services to the community. The policy of the Government was the provision of medical services to all members of the community through the hospitals. The *Public Hospitals Act* of 1936 provided: "That the function of the board of a hospital in a district shall be the treatment of the sick in that district, and the term 'treatment of the sick' shall, but

without limiting the generality of its meaning, include and be deemed to include all forms and methods of treatment of the sick." Already the boards of hospitals were exercising the powers given to them under this Act. The General Secretary exemplified this by describing the activities of the Board of the Maryborough District Hospital. Maryborough was a town with a population of about 11,500. The general hospital contained approximately 100 beds. Within the past few months the Board had appointed a superintendent, at a salary of £1,250 *per annum* with quarters. In addition, the Board had appointed two medical officers, one at a salary of £750 and the other at £400 *per annum*. The services of the hospital were available to every member of the community. The charge for maintenance of in-patients in the public wards was £3 3s. a week. Private beds were available at £4 4s. a week, and in addition to the maintenance charge made to private patients, the hospital charged for the treatment received by the patient. The Board openly advertised that private accommodation was available at the hospital and had under consideration the erection of a special private block at a cost of £25,000. In addition to in-patient services, the hospital provided out-patient services. As the hospital was situated two miles out of the town, the Board had established an out-patient department in the centre of the town. At the moment domiciliary attendance was not provided, but the Board had the provision of such a service under consideration. The doctors in private practice were not allowed to attend the public hospital and so were unable to follow their patients into hospital. Like most other hospitals, Maryborough Hospital had a contributory scheme for wage-earners, the contribution being twopence in the pound. A contributor was entitled to in-patient and out-patient services and also to ambulance service. This contributory scheme was, of course, affecting the membership of the friendly societies. The General Secretary pointed out to the members of the Federal Council that, with an efficient staff, the hospital must be a very serious competitor with private practitioners.

The Secretary went on to say that in company with Dr. T. A. Price, the President of the Queensland Branch, he had visited the coastal towns and had placed, not only before members of the British Medical Association, but also before representatives of friendly societies, trades unions and hospital boards, the views of the Association as adopted by the Federal Council on September 7, 1935, in regard to the provision of a general medical service for Australia. The campaign had been started in Brisbane. The first meeting had been held with the Friendly Societies' Association. It had been a very friendly gathering, and subsequently the Branch Council had received from the Secretary of the Friendly Society Council a letter approving of the policy of the Association. Subsequently, interviews and discussions had taken place with leading trades union officials; these the General Secretary enumerated. One and all had been interested in the policy, and in many instances officials in other centres had been advised of the Association's views. The General Secretary and Dr. Price had included in their tour the towns of Innisfail, Ingham, Townsville, Ayr, Mackay, Rockhampton, Gladstone, Bundaberg, Maryborough and Gympie. In each town addresses had been given on the Association's policy and on health insurance, not only to members of the British Medical Association, but also to representatives of friendly societies, trades unions, hospital boards and members of the dental profession. In conversations with lay persons, emphasis had been laid on the need for efficient hospitals, on the disadvantages of centralizing the whole of medical care in institutions, and on the importance of allowing members of the community free choice of their medical attendant. An attempt had been made to point out that the Association's policy would provide the community with a service, both curative and preventive, which would be available to every member of the community, and that such a service would be infinitely more satisfactory than any nationalized or institutional service The reception had generally been most cordial.

Dr. T. A. Price expressed to the Federal Council the appreciation of the Queensland Branch of the efforts of Dr. Hunter, and said that he thought his services would be valuable in other places, such as Tasmania. The report was received, and Sir Henry Newland, from the chair, thanked both Dr. Price and Dr. Hunter for their services.

A Donation to the Federal Council.

The General Secretary reported that Dr. R. H. Oxby Donald, of Tasmania, had forwarded to the Editor of THE MEDICAL JOURNAL OF AUSTRALIA a donation of £5 5s. towards the Federal Council funds, as a result of a leading article published in the journal. The Council expressed its keen appreciation of the gift.

Australian Medical Directory.

A letter was read from the publisher of the "Australian Medical Directory" to the effect that an edition for 1938 was being prepared.

"Who's Who in Australia."

The South Australian Branch referred to the Federal Council for opinion a letter from the editor of "Who's Who in Australia", requesting that he be furnished with a list of officers of the South Australian Branch. It was decided to advise the South Australian Branch to accede to the request.

Professional Secrecy.

A communication was received from the Tasmanian Branch on the subject of medical evidence and professional secrecy. The statement, which had been drawn up on legal advice, was as follows:

The Council of the Tasmanian Branch of the British Medical Association, at a meeting held in Hobart last week, gave consideration to the question raised at a recent coronial inquiry as to whether a medical practitioner is under any legal obligation to disclose to the police authorities information which he received from a patient through his attendance upon her, and the remarks of the Coroner (Mr. Wilfred Hutchins) on this point.

The Coroner is reported to have stated that Dr. Brettingham-Moore should have divulged to the police the statement made to him by the patient, and that it was the practice at the Hobart General Hospital, when a doctor had a statement made to him warranting such a course, to communicate with the police, and he informed Dr. Brettingham-Moore that it was the proper thing for him to do for his own protection.

As the view held by the Coroner is contrary to the practice laid down by organized medical opinion, supported by eminent legal authorities, and followed, and as the members of the Association are most anxious to preserve the confidential relations which exist, and must exist, between the medical man and the patient to enable the proper discharge of his duty, it has been decided to make public the attitude of members on this subject.

This particular question as to the duty of the doctor in communicating with the police in cases of suspected abortion was exhaustively dealt with by the medical profession and other bodies in England in 1916. The Royal College of Physicians of London obtained from the Censors' Board a report containing medical and legal opinions. This report was circulated to the Prosecutor, the Royal College of Surgeons, the General Medical Council and the medical Press. Finally, in 1916, the report was slightly varied to meet with the wishes of the Public Prosecutor and, after taking the opinion of eminent counsel (the late Sir Richard Muir), certain resolutions were passed for the guidance of medical practitioners.

The resolution first set out what is the proper professional practice. They reaffirm the solemn duty to respect the confidence of the patient, and that without her consent the doctor is not justified in disclosing information obtained in the course of his professional attendance upon her, except in answer to questions put to him with the approval of a judge in court. They set out that, if a doctor suspects that an illegal operation has been performed, he should urge the patient to make a statement to the police

authorities disclosing the name of the abortionist, especially if, in his opinion, the patient is not likely to recover, provided, of course, that the prospects of recovery of the patient shall not be prejudiced thereby; and the report further stated that, if the patient refuses to make the statement, the doctor is not legally obliged to pursue the matter further.

The medical profession, both in England and in Australia, have acted in full accord with these regulations, which, as above stated, received the complete approbation of the Director of Public Prosecution in England.

The Medical Association does not claim any professional privilege to withhold information of the nature in question when called as a witness, it being quite recognized that a doctor must answer all questions in accordance with the directions of the presiding judge; but that, of course, is an entirely different position from giving information to the police outside court, and it is on this point that the Association is at variance with the Coroner. We claim that there is no obligation whatever for the doctor to give information to the police, or to take any steps to set the criminal law in motion.

The English judge, the late Mr. Justice Hawkins, in a case concerning an illegal operation, told the jury that he very much doubted whether in such a case the doctor would be justified in reporting the facts to the Public Prosecutor.

We are advised that the cases quoted by the Coroner only related to the obligation of the doctor when adducing evidence in Court, and therefore have no bearing on the important question with which we are concerned, namely, whether a doctor is under any obligation to give information to the police obtained in the course of professional attendances, which involves or indicates that a criminal offence has been committed.

The attitude set out above has always been the practice followed by members of the British Medical Association in England and Australia.

A copy of this statement is being forwarded to the Southern Tasmanian Law Society and the Solicitor-General for their comments and observation.

International Congress of Ophthalmology.

A request was received from the Director-General of Health, Commonwealth Department of Health, asking the Federal Council to nominate a delegate to attend the International Congress on Ophthalmology to be held in Cairo in December, 1937. No funds were available to pay the expenses of the delegate, but it was thought that an Australian ophthalmic surgeon who was travelling abroad at that time might be able to attend. The General Secretary said that so far he had been unable to learn that any member of the Association would be prepared to attend.

Hospitality to Overseas Visitors in England.

The General Secretary reported that he had received a letter from the Plymouth Division of the British Medical Association offering private hospitality to overseas members during Coronation week. The offer, which had been communicated to the several Branches, was much appreciated by the Federal Council, and it was resolved that a letter of thanks should be sent to the Plymouth Division.

A Congress Section of Medical Sociology.

A proposal was received for the formation at sessions of the Australasian Medical Congress of a Section of Medical Sociology. It was proposed that at meetings of this section matters relating to medical practice, such as contract-practice and the relationship of the profession to the Government and to the public, should be discussed. Dr. J. Newman Morris pointed out that sectional meetings of Congress dealt exclusively with medical science and that there was no body in Australia, other than the Federal Council, which considered medico-political matters as they affected all the Branches. A proposal had been made some years previously by the Queensland Branch that a meeting of delegates from all the Australian Branches should be held before each session of Congress for the discussion of medico-political matters. This proposal, for various reasons, had not been adopted. Consideration of this question was deferred in view of the proposed formation of an Australian medical association, for if such an organization came into existence a body analogous with the Representative Body in England would be formed.

Freedom of Choice of Medical Attendant.

An urgent communication was received from the Victorian Branch following on an incident in which a departmental medical officer was alleged to have recommended a patient entitled to benefits of a *Workers' Compensation Act* to seek the services of a particular surgeon. General discussion followed on the advisability of every patient, whether he was being dealt with by departmental or insurance medical officers, being allowed free choice of his doctor. The view was expressed that the proper procedure for a medical officer to adopt was to ask the patient for the name of his own private medical attendant, so that he might take the advice of the latter. If the services of a surgeon were required and the patient had no private medical attendant, the patient should be provided with a list of surgeons and should be allowed to choose which of them he preferred to consult.

After discussion it was resolved:

> When an insurance company requires a consultation between its medical officer and a practitioner attending the case, such insurance medical officer shall take no active part in the treatment of such case without the expressed request of the practitioner concerned.
>
> That in regard to the treatment of an injured worker entitled to the benefits of a State or Commonwealth *Workers' Compensation Act* the Council is of the opinion:
>
> (i) That there should be no interference with the right of the worker to choose his own medical attendant.
>
> (ii) That in the event of the worker having no regular medical attendant, he should be furnished with a list of available medical practitioners from whom he might choose.

The Visit of Sir Henry Brackenbury to Australia.

The General Secretary reported that Sir Henry Brackenbury, formerly Chairman of the Council of the Parent Body, was visiting New Zealand and would be in Australia for only a few days on his way to England. The Queensland Branch was very anxious that Sir Henry Brackenbury should visit Brisbane to advise them in their problems. Dr. J. Newman Morris said that the Victorian Branch was anxious to entertain Sir Henry Brackenbury, but nothing could be decided until his arrival in Australia.

Australasian Medical Congress (British Medical Association).

Copies of the minutes of the Executive Committee of the Fifth Session of the Australasian Medical Congress (British Medical Association) were laid on the table.

It was noted that His Excellency the Right Honourable Lord Wakehurst, K.C.M.G., Governor of New South Wales, and the Lord Mayor of Adelaide had accepted the position of Patron for the Fifth Session. The position of Vice-President had also been accepted by Sir James Barrett, Dr. D. H. E. Lines, Dr. G. H. Abbott, Dr. W. N. Robertson and Dr. R. H. Fetherston.

Sixth Session.

A letter was read from the Queensland Branch inviting the Federal Council to hold the sixth session in Brisbane in 1940. At the same time the Queensland Branch stated that it did not wish to press its claim if, in the opinion of the Federal Council, any other branch had a prior claim. The representatives of the Western Australian Branch conveyed an invitation from the Council of their Branch that the sixth session should be held in Perth in 1940. It

was pointed out that the previous decision to hold the fourth session in Perth had been abandoned owing to the financial depression. The members of the Federal Council were unanimous in the view that the holding of a congress in Perth would be a great advantage to the members of the Branch in that State, and it was thought that by 1940 Perth would be much easier of access by air. The Queensland representatives withdrew their invitation and the Council unanimously accepted the invitation of the Western Australian Branch Council.

Formation of Special Associations within the Association.

At the previous two meetings of the Federal Council, consideration was given to the formation of special associations within the profession.

The General Secretary reported that a copy of the proposed new Article and By-Laws for the Federal Council had been submitted to the Branches. It was decided that, subject to the approval of the Central Council of the British Medical Association, a new Article and By-Laws be constructed. The adoption of this new article will enable the Federal Council, either alone or in conjunction with the Branches, to initiate, promote and/or approve of the formation of special groups consisting of members from more than one Branch having distinctive professional interests. No person shall be eligible to become a member of a special group unless he is a Branch member and possesses the qualifications for membership of that special group which are from time to time approved by the Federal Council.

Principles of Medical Ethics.

The General Secretary stated that, owing to the absence of Dr. A. J. Collins in England, he had no report to offer from the subcommittee appointed to consider the principles of medical ethics.

Uniform Medical Registration.

At the last meeting of the Federal Council consideration of a motion on the subject of uniform medical registration for Australia was deferred. The subcommittee appointed to deal with the matter consisted of the President (Sir Henry Newland), Dr. J. Newman Morris and Dr. D. D. Paton. The subcommittee had been unable to meet, but Dr. Morris presented a majority and a minority report.

The majority report was presented in the form of a bill ready for introduction to Parliament providing for uniform registration of medical practitioners and medical students, a proper regulation of registered practitioners, and measures to regulate and prohibit the practice of unregistered persons, together with a statement setting out the reasons in favour of uniform registration. Dr. Paton's minority report pointed out that Western Australia was not anxious to have uniform medical registration, but desired uniformity in the provisions of the medical Acts of the several States. One member pointed out that, in addressing the recent congress of the dental profession in Sydney, Dr. Earle Page, as Commonwealth Minister, had agreed that uniform registration of members of the dental profession in Australia was desirable. At the same time, it was apparent that uniform medical registration could not be achieved in Australia without a referendum, and members of the Federal Council thought that this would never be achieved. Dr. F. L. Davies was opposed to the idea of drawing up a bill. He thought that such a proposal would never be accepted; in his opinion, constructive suggestions should be made and nothing more. After discussion it was resolved:

> That the report with an epitome be sent to Branch Councils for consideration and that each Branch be asked to indicate what degree of autonomy was required in its State.

Precaution Against Gas Attacks in Warfare.

Further reference was made to the need for instructing the public in regard to the precautions to be taken in gas attacks in warfare. The Federal Council had before it a request from the Queensland Branch that the Council should approach the Federal Government to ascertain what equipment was available and what chance there was of obtaining equipment in the near future. The opinion was expressed that the Federal Government would be unlikely to reply to such a request. Each Branch had been asked to form a committee to consider the matter. Several Branches had held discussions on gas warfare and on methods of protection. After discussion, it was resolved that the Federal Government should be asked what its policy was in regard to the protection of the civil population in gas attacks.

The National Health and Medical Research Council.

Dr. J. Newman Morris, the representative of the Federal Council on the National Health and Medical Research Council, reported that progress had been made, that a sum of money, not yet definitely stated, was on the estimates and would be put at the disposal of the National Health and Medical Research Council. The question of research was being dealt with by a Reference Subcommittee. This subcommittee had power to coopt and had coopted experts whose advice would be valuable. A number of requests for grants had been received, and these had been considered at a meeting held in Melbourne a day or two previously.

The Broadcasting of Health Talks.

Further consideration was given to the broadcasting of health talks, and correspondence was read from the Minister for Health and the Tasmanian Branch. The view had been expressed in certain quarters that the name of the speaker should be announced. This view was not acceptable to the Branch Council, although in some States names were given when the speakers were departmental medical officers or university teachers not engaged in private practice. The Commonwealth Minister for Health held that if the Commonwealth Health Department invited a practitioner to give a talk, his name should be used. It was resolved that the qualifications of the speaker should be given without his name, and that the announcement should be made that the talk was uder the ægis of the British Medical Association.

The Possible Influx of European Medical Practitioners into Australia.

At the previous meeting of the Federal Council reference was made to the possible influx of European medical practitioners into Australia. Correspondence was read between the Council of the Parent Body, the Department of External Affairs of the Commonwealth, the Minister for Health in each State, and also the Victorian Branch. Since this matter is at present *sub judice*, it cannot be discussed.

Civil Aviation Landing Grounds.

Further reference was made to the provision of civil aviation landing grounds in the country. The General Secretary reported that letters had been written to the municipal associations in the several States and to the Branches. In Queensland, as in Western Australia, many of the associations had taken the matter up. Two interesting letters were read by Dr. L. E. Le Souef from shire councils in the northern and southern districts of Western Australia. In one of these letters the council suggested that the Commonwealth authorities should be asked to devote part of the money derived from the petrol tax to the provision of safe landing grounds.

Dr. J. Newman Morris suggested that the replies should be collated and that action should be taken. It was decided that the information should be sent to the Minister of Health for the Commonwealth, to the Minister for Defence, and to the Health Department of each State, advising of the action taken by the Federal Council and requesting that consideration be given to the question of affording financial assistance to shire councils in order to enable them to establish safe landing grounds.

The Prevention of Blindness.

A letter was received from the Director-General of Health, Commonwealth Department of Health, requesting that the Federal Council should appoint a committee to consider the prevention of blindness and to prepare suggestions for submission to the National Health and Medical Research Council. After discussion, it was suggested that the Section of Ophthalmology at the fifth session of the Australasian Medical Congress (British Medical Association) should be asked to discuss the matter and make suggestions in regard to the personnel of a committee which the Council had decided should be formed for the purpose of furnishing a report.

Artificially Induced Abortion.

As the problem of abortion was to be considered by the National Health and Medical Research Council, Dr. J. Newman Morris, the representative of the Federal Council on that body, requested that he be advised of the views of the Branches on the problem. The Branches were communicated with and requested to appoint committees: (i) to collect information on the subject of artificially induced abortion; (ii) to ascertain the causes thereof, economic and otherwise; (iii) to make proposals with the object of lessening the practice.

The reports of the Branches will be forwarded to Dr. Newman Morris.

National Health Insurance.

The Federal Council considered national health insurance. It had before it a copy of the report on health and pensions insurance compiled by Sir Walter S. Kinnear, Controller of Insurance Department of the Ministry of Health and Deputy Chairman of the National Health Insurance Joint Committee, Great Britain, who had come to Australia at the invitation of the Commonwealth Government. It was pointed out that the scheme suggested by Sir Walter Kinnear was practically identical with the English scheme. It was a scheme of medical benefit and of general practitioner service. It was to be applicable to persons aged sixteen and over, except those employed otherwise than by manual labour whose rate of remuneration exceeded £365 a year. This meant that there were over 1,800,000 persons to be insured. The medical benefit was to consist of free medical attendance and treatment, including medicines and certain medical and surgical appliances. The opinion was expressed that there was really very little on which to comment. Attention, however, was drawn to the fact that Sir Walter Kinnear had stated that arrangements for medical benefit should be made between the central department and the responsible bodies representing the medical profession and the chemists. In discussion it became apparent that some decision would have to be made by the Federal Council regarding details which would be acceptable to members of the British Medical Association in Australia. These details included such questions as the income limit of insured persons, the capitation fee payable to medical practitioners, the number of insured persons that an individual medical practitioner should be allowed to attend, and so on. The Council was unanimous that it was the duty of the medical profession to provide a willing and efficient service, and also that a medical practitioner should be allowed to undertake the treatment of only such a number of persons as he could treat in an efficient and adequate way. It was thought that in the near future the President, acting as the mouthpiece of the Council, might have to answer certain detailed inquiries from the Commonwealth authorities. The Council therefore discussed practical details.

The first matter raised had to do with the income limit of insured persons other than manual workers. For this purpose the income limits adopted in the friendly society lodge agreements in the several States were compared and it was decided that an income limit of £365 *per annum* would be acceptable. In the making of this decision consideration was given to the fact that persons attended by medical officers of friendly society lodges were picked lives, in that the lodge medical officer could reject from lodge membership a person who was suffering from a chronic illness, or one whose state of health was such that he would be a burden on lodge funds. The same consideration influenced the Council in arriving at a suitable figure for the capitation fee. It was resolved that £1 *per annum* per insured person would be a suitable figure. If a family benefit was to be included, £2 *per annum* was regarded as acceptable.

The Federal Council then discussed the number of insured persons that a medical practitioner should be allowed to have on his lists. Again it was emphasized that efficiency should be the keynote of the service, all the members of the Council holding that if the lists were too large, proper time could not be devoted either to diagnosis or to treatment. It was pointed out that the treatment had to include all proper and necessary medical services as could reasonably be expected to be undertaken by a general practitioner, including the issuing of certificates and the furnishing of reports. It was resolved that it would be desirable to limit the number of insured persons to 1,500 without dependants.

The Federal Council then considered the establishment of a maternity benefit which, it was realized, would be entirely separate from the health insurance scheme. In the discussion several members emphasized the importance of ante-natal care of pregnant women, and the Council agreed that a general realization of the importance of ante-natal care would lead to a reduction in maternal mortality and morbidity. The Council therefore resolved:

> The Council is of opinion that a maternity benefit scheme should be instituted by the Commonwealth Government on a compulsory and contributory basis. This should take the place of the present maternity bonus scheme and should have as a condition adequate ante-natal attendance, where available. The Council believes that such scheme would have a material effect on maternal morbidity and mortality in Australia.

After discussion on a suitable fee for such a service, it was resolved that £4 4s. would be acceptable and that this sum should include the treatment for ante-natal care.

Medical Services in Country Districts in Tasmania.

The Federal Council considered a communication from the Tasmanian Branch dealing with the proposal of the Premier of Tasmania to appoint medical practitioners as whole-time officers in the sparsely populated areas of Tasmania. The Tasmanian Branch Council asked for the help and guidance of the Federal Council. The representatives from Western Australia stated that apparently the proposed service would be conducted on lines somewhat similar to those operating in the northern areas of Western Australia. In these districts practitioners, generally younger graduates, were appointed at a salary of £1,000 *per annum*, and they undertook the medical and surgical treatment of everyone in the district. Fees that were collected were paid to the Government and the practitioner had no rights of private practice. It was stated that this service was in certain areas connected with the Aerial Medical Service, and that the general result was most satisfactory. Dr. T. A. Price also referred to similar areas in the far northern parts of Queensland. After discussion it was resolved:

> The Federal Council has had before it the outlines of the proposed scheme of whole-time medical service for the outlying and sparsely populated districts of Tasmania. Experience in other parts of Australia, notably in Western Australia, has demonstrated that a good service of this description can be instituted. This has been effected by the closest cooperation between all parties concerned, namely, the Government, the medical profession (through the British Medical Association) and the people. The Federal Council, therefore, is convinced that with such cooperation such a service is both possible and desirable in Tasmania, and is prepared to give any cooperation

and assistance in its power. Special efforts should be made to minimize the hardship and loss which might occur to medical men practising in these areas at the present time. For these purposes it offers the help of its General Secretary, Dr. G. J. Hunter, whose wide knowledge of conditions of medical service in Australia should prove invaluable.

It was decided that a copy of this resolution should be sent to the Premier of Tasmania.

The Australian Army Medical Corps.

Further consideration was given to the proposal, previously considered by the Federal Council, that an officer of the Australian Army Medical Corps should be sent to England to study military medical matters. The Federal Council believes that owing to the advances that have been made in modern methods of warfare, of treatment of the wounded, and of dealing with gas attacks, an Australian officer should be sent to England to study these methods in case they should be needed in future defence. It was resolved that the authorities should be again approached on the subject and that emphasis should be laid on the urgent necessity for the study of problems altogether unconnected with gas warfare.

Date and Place of the Next Meeting.

The determination of the date and place of the next meeting was left in the hands of the President.

Votes of Thanks.

A vote of thanks was accorded to the Council of the South Australian Branch of the British Medical Association for having provided accommodation for the meeting, and for its hospitality.

A vote of thanks was also accorded to Sir Henry Newland for having presided at the meeting.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at the Medical Society Hall, East Melbourne, on Wednesday, July 7, 1937, PROFESSOR R. MARSHALL ALLAN, the President, in the chair.

Osteomyelitis.

DR. STANLEY W. WILLIAMS read a paper entitled "The Early Treatment of Acute Staphylococcal Osteomyelitis" (see page 459).

DR. F. G. MORGAN said that when Dr. Williams had consulted him in 1935 with a view to undertaking the experimental use of staphylococcal antitoxin in a series of cases of osteomyelitis at the Children's Hospital, it had been recognized that this type of case was probably not favourable for the demonstration of any striking effect of antiserum in combating infection by the staphylococcus. Having in mind, however, the serious nature of the disease and the serious disability that frequently followed it, it had been resolved to try and determine if possible what beneficial effect could be obtained from the use of serum in such cases. It had been agreed, further, that in order to obtain reliable data it was essential to treat alternate patients with and without serum respectively. It had been considered that, given a sufficiently lengthy series of serum-treated patients and controls, any obvious benefit would be made apparent eventually. In fact, the general clinical improvement and any lessening of mortality or disability that might result would be regarded as the criteria on which to judge the efficacy of the specific treatment. It had been hoped, therefore, that serum would be beneficial by lowering the mortality, by limiting the extension of the infection to other foci, and, possibly, by favourably influencing the rate of healing of the lesion in the bone.

From the figures given that evening little appeared to have been accomplished so far; but, as mentioned already, the series was small. Likewise there had been a period when no serum was given for several months, and, during that time, one death only had occurred amongst the controls treated by the usual methods and without serum. Dr. Williams had said that, when the 24 cases in which serum was used were compared strictly with 24 cases without serum, the mortality rates were in favour of the former, the rates being 25% and 16% respectively.

Dr. Morgan said that, as the mortality appeared to vary according to season and year, it was, in his opinion, fair only to compare the cases that had been strictly alternated. He thought that the work should be continued, and he said that Dr. Williams shared that opinion. He said that when he had been in Montreal in November, 1933, Professor E. G. D. Murray had been most enthusiastic concerning the use of staphylococcal antitoxin that he had received from Dr. Dolman, of Toronto. It had been found that the serum was beneficial in the treatment of all types of staphylococcal infection, including septicæmia. Professor Murray had also obtained rapid cure in localized staphylococcal infections. He had referred in particular to a patient who had been gravely ill with multiple bone abscesses and septicæmia due to staphylococci. This patient had recovered under serum treatment. Dr. Morgan said that in Toronto, a little later, he had also found that Dolman was enthusiastic about the promise of serum therapy in staphylococcal infections of all types. His paper on the subject had appeared subsequently.

Dr. Williams's cases included osteomyelitis only, and while this series, a small one, did not favour serum treatment to any extent, it was well to bear in mind the pathology of the disease and refrain from giving judgement on the possible efficacy of this serum in the treatment of other types of staphylococcal infections. A thorough investigation of the pathology of staphylococcal osteomyelitis might make it possible to employ specific therapy more efficiently in such infections.

Dr. Morgan suggested the possibility that better results might be obtained if it was only known when was the optimum time to commence treatment with serum. The tendency would be to say: "Let us employ serum as soon as the disease can be diagnosed with a view to checking the spread either locally or into the general systemic circulation." For the staphylococcus to reach those parts of the deeper tissues where it caused a presumably localized infection, it must be carried by the blood stream in the vast majority of cases. Was it, however, always an infection secondary to some established inflammatory focus elsewhere? Might it be in certain cases merely a symptom of generalized infection? Were all such cases to be regarded as resulting from a chance embolus of septic material lodged in the bone, the subsequent general infection being merely secondary to the bony lesion?

Dr. Morgan said that it had always appeared to him difficult to obtain in these lesions of the bone an adequate transference of the immune bodies administered in the serum to the site of the infection. Whereas the bone marrow might be plentifully supplied with blood, the denser tissues under inflammatory conditions might be almost entirely deprived of blood supply as the result of inflammation. Consequently it was in the direction of reducing extension of the disease from the bone, by combating general infection and toxæmia, that improvement might be hoped for.

Dolman had been successful in reducing the mortality in his series from approximately 50% to 30%. Unfortunately it was impossible to compare exactly the amount of serum given by Dr. Williams with that administered by Dolman. Dolman's dosage was expressed in terms of cubic centimetres of serum, as at that time no international standard had existed, so that the unitage could not be expressed in terms of international standard. The dosage used by Dr. Williams was expressed in terms of standard anti-hæmolytic units, and it was quite possible that as yet a sufficiently high concentration of units in the blood in such cases had not been reached.

During this series organisms had been cultured from pus from the local lesion, and, in a few cases, from the blood, in the pathological department of the Children's Hospital. In most cases these cultures had been forwarded to the Commonwealth Serum Laboratories, where they had been investigated. A total of forty cultures had been received, and in all but four cases each strain of staphylococcus had been found capable of producing hæmolytic exotoxins of high potency. These toxins had been examined mainly from the viewpoint of their hæmolytic, dermonecrotic and lethal effect for animals. They had been arranged in two groups, according to their combining affinity for antitoxins of special type; that work had been reported elsewhere.

Latterly Panton and Valentine had stressed the importance of leucocidin in staphylococcal toxins and had expressed the opinion that leucocidin was a very important constituent of staphylococcal toxin and that its presence largely determined the severity and character of infections with this organism. Dr. Morgan said that while he did not propose to discuss the merits of this contention, it was sufficient to say that the toxins employed in immunizing horses at the Commonwealth Serum Laboratories and that the antitoxins derived therefrom were representative of such properties as those referable to the leucocidin-antileucocidin complex.

In conclusion, Dr. Morgan congratulated Dr. Williams on his energy and enthusiasm in undertaking this work and expressed the hope that the experiment would be continued until it could be ascertained whether serum of this type would be beneficial or not in such cases.

DR. F. M. BURNET said that he would confine his remarks to the bacteriological side of the subject. He had understood that Dr. Williams's series of patients had been treated with antitoxic serum from the point of view that the α toxin was the agent mainly responsible for the lesions and that the antitoxin used had been titrated for α toxin only. It was now soundly established that antitoxic immunity was much more important than anti-bacterial immunity in determining the fate of staphylococcal infections in the rabbit. However, a rabbit was not a natural host of the staphylococcus and man was. Quite early in childhood the ubiquitous staphylococci of the skin and mucous membranes induced the formation of antitoxin, providing a basic antitoxic immunity that lasted through life. Downie's recent work indicated that the lesions produced in an immunized rabbit were very like those in an ordinary boil in man. Dr. Burnet would take the general point of view that most human beings had developed an adequate immunological mechanism for dealing with staphylococci and that the appearance of gross staphylococcal lesions as a rule indicated some breakdown in defence from other than immunological reasons.

Dr. Burnet then devoted his attention to the serum treatment and the reasons for its apparent failure in the series described by Dr. Williams. The reasons fell under two main headings. The first group was related to the fact that the lesions were such that antitoxin could not influence them. The second group concerned either the inadequacy of the serum or the inadequate dosage of suitable serum.

Under the first heading, Dr. Burnet said that deep-seated chronic staphylococcal processes regularly produced large quantities of antitoxin in the blood, but were not apparently much influenced thereby. If naturally produced antitoxin could not deal with the lesions, not much was to be expected from the use of foreign antitoxin. The main hope must be that antitoxin could help to limit acute spreading processes in individuals without normal antitoxin. Dr. Burnet considered it probable that the Bundaberg children were divided into two groups; in one of these the children died, in the other they suffered from local abscesses only, according to whether they had or had not normal staphylococcal antibodies, particularly antitoxin. The youngest of these children had died with fulminating symptoms, but the older children had localized the staphylococcal infections and had only had abscesses at the point of inoculation. This difference might have been due to the degree of active immunization of the individuals concerned. From the theoretical point of view Dr. Burnet would very much like to know whether those children who had suffered from early extreme toxæmia in Dr. Williams's series had been lacking in antitoxin at that period. If this state of affairs was proved it would provide a rational basis for antitoxin therapy.

Turning to the other set of reasons, Dr. Burnet said that the serum could only be titrated for α antitoxin, which was probably the most important antibody; but there were other adjuvant antibodies that might also be of importance. Dr. Burnet expressed grave doubts whether horse antibodies could be regarded as anything more than a very rough copy of human antibodies, which probably approximated more to the rabbit type. It might be necessary to look into the question of the species producing the antitoxin.

DR. H. DOUGLAS STEPHENS congratulated Dr. Williams on the work that he had done and the way in which he had presented his results. When in England, Dr. Stephens had been informed that osteomyelitis was a disappearing disease there. The reason that had been suggested for its diminution was that personal hygiene was improving. As the condition was more prevalent here than there, Dr. Stephens could not agree with this view. At University College Hospital, London, they had managed to collect ninety-one cases in twenty years, and 20% of the patients had died. Lloyd had quoted statistics showing that between one-quarter and one-half of those affected had died. At the Children's Hospital, Melbourne, there had been seventy-seven cases in the previous eighteen months, with a mortality rate of 16%. The incidence waxed and waned from thirty-five to seventy-five a year, the mortality varying from 10% to 24%. The source of the organism was from impetigo, boils, intestinal toxæmia, or less frequently, from such conditions as scarlet fever. The children who were subject to these lesions were thought to have a lowered resistance to the staphylococcus. In 90% of cases the staphylococcus was the infecting organism; but in the remaining cases streptococci or pneumococci were mainly responsible. The metaphysis was the usual site of infection in bone, and in most cases a history of preceding injury could be obtained. The lower limb was most frequently involved, and boys were affected four times as frequently as girls. Dr. Stephens demonstrated on diagrams the mode of spread of the condition from the initial site in the metaphysis. He pointed out that it was essential that the diagnosis should be made on clinical grounds; the skiagrams were not of any help before the ninth day, though cultures of urine and blood might be of assistance. There was an acute onset in over 50% of cases; the bones involved were the tibia, the femur, the humerus and the fibula in that order of frequency. Pain and tenderness at one of these sites of election for the disease were the leading signs. Other local manifestations of inflammation varied considerably. In addition, there were signs of general toxæmia, which varied from the mildest to the most severe, according to the degree of tension, the virulence of the organism and the resistance of the child.

Dr. Stephens said that the cases could be divided into three groups: (i) fulminating, (ii) acute, (iii) subacute. In the fulminating cases there were overwhelming toxæmia, delirium, coma, high pulse rate and high temperature, occasionally high pulse rate without much elevation of temperature, dry tongue, refusal to take drinks, vomiting and apathy. These general signs might overshadow the local lesion, which might even be overlooked if the child was unable to help in the localization. The disease ran a rapid course, and death took place as a rule in four to eight days, whatever was done. At autopsy emboli were found in the lungs and heart and other organs, and pericarditis was present. If signs suggestive of the presence of emboli in the lungs were found, Dr. Stephens regarded the condition as inoperable. These cases occurred rarely; Amberg quoted 1% in 360 cases; but Dr. Stephens had the impression that, in his experience, they would amount to approximately 5%.

The acute case was the common type, with sharp local features. The onset was with high fever and perhaps rigor or transient delirium. However, the patient was

able to take drinks and could explain the local pain and indicate the site of tenderness. The value of accurate localization of the tender spot was essential from the operative point of view.

In the subacute variety local signs were present; but the general features were minimal. Occasionally resolution occurred without operation and without subsequent impairment. They resembled many of the late metastatic foci of the acute types, which occurred in the ulna or radius and resolved without operation. Dr. Stephens regarded this as evidence of a good immunity response. Many of the lesions of the subacute variety developed into low-grade bone abscesses, and most of them required to be opened sooner or later.

After discussing the diagnosis Dr. Stephens referred at some length to the treatment. He emphasized that the real decision to make was when to operate and what to do. At one time every patient had been operated upon, whether the condition was mild or severe. Immediate operation had been the rule and some very mutilating procedures had been carried out. The frequently repeated dressings were very painful and a general anæsthetic was often used to mitigate the suffering of the patient. In very recent years, however, two advances in treatment had been made. A more conservative attitude was adopted in respect of the surgical operation selected, and the plaster method of fixation of the part had minimized the frequency of the dressings. Dr. Stephens indicated that he preferred early operation after localization of the site, and he was as conservative as possible in the procedure he followed at operation. He liked to use a tourniquet for lesions distal to the knee and occasionally for the lower end of the humerus, but rarely for the lower end of the femur. If on division of the periosteum pus escaped and the opening through the cortex was of adequate size for drainage, no further operative work was done. If no pus was obtained, or the opening was too small and the general toxæmia was severe, several drill holes in the area facilitated drainage without adding much to the stress of the operation. The periosteum should be incised for the full extent of the collection of pus and the cortex drilled at intervals of one centimetre. Dr. Stephens said that he disapproved of guttering, saucering or curetting in the acute types, and that he did not use the iodine and spirit of the Winnett-Orr technique. He applied a plaster cast, which was not removed, except for special reasons, for a period of four to six weeks.

In conclusion, Dr. Stephens related two histories of cases to emphasize his opinion that the disease should be attacked early, when the local indications were clear cut and precise, and long before the formation of a big abscess or much necrosis had occurred.

A boy who had had acute osteomyelitis of the hip, after some months of non-operative treatment, during which a subcutaneous collection of pus had formed and had been drained, had attended hospital with the hip ankylosed in a flexed and adducted position. His urine had contained pus and a hard swelling had projected into the pelvis. He had a collection of pus, adherent to the bladder, containing pieces of dead bone, some of which had passed into the bladder. Subsequently a sequestrum had blocked the membranous urethra and had been removed by Dr. Stephens through a perineal section. Since then other sequestra had been removed *per urethram*.

The other patient had had acute osteomyelitis of the lumbar spine and a large quantity of pus had been removed through a lumbar incision. Pus had, however, tracked along the psoas muscle and had caused an acute suppurative arthritis of the hip.

Dr. Stephens stated that, even if the whole diaphysis was floating in pus, the shaft should be left to act as scaffolding for new bone, and when a good involucrum had formed the dead shaft could be removed as a sequestrum. He indicated that in the subacute type operation could be deferred in many instances until a subcutaneous incision only was needed. He refrained from discussing osteomyelitis in children under the age of three years, as he regarded it as an entirely different disease, and milder in every way.

Dr. M. Kent Hughes showed a coloured cinematograph film that he had prepared. It represented the procedure adopted by Dr. J. B. Colquhoun in performing the Winnett-Orr operation on a child with osteomyelitis at the Children's Hospital.

Dr. J. B. Colquhoun tendered his thanks to Dr. Williams for the enthusiasm he had displayed in connexion with this piece of work. It had been a very great influence in stimulating interest in osteomyelitis at the Children's Hospital. In the beginning, Dr. Colquhoun had been sceptical about the value of antitoxic serum, and though Dr. Williams had failed to prove his case, Dr. Colquhoun complimented him on the honesty he had displayed in the presentation of the results.

Though in comparison with Dr. Stephens's experience Dr. Colquhoun realized that his own experience was very limited, he had noticed too that in the previous ten years great changes had taken place in the treatment of these patients. His experience had accumulated in many different parts of the world, and he had been impressed with the way in which the virulence of the disease varied from time to time and from place to place. One might go for periods of years without encountering any fulminating cases, and during these periods the impression grew that good results were obtained by conservative measures. On the other hand, when the proportion of fulminating cases was high these good results were not so obvious. He had learnt a lesson as a house surgeon, when it was considered correct to operate immediately and to remove the whole diaphysis. The mortality rate was high and serious disability followed for the survivors. Cones of bone formed above and below, and were connected by the merest thread of bone. Even in the previous few years he had seen some of the late results of this form of treatment. Dr. Colquhoun felt sure that if a series of patients treated by the Winnett-Orr method was compared with a series treated after incision by means of frequent dressings and repeated irrigation with an antiseptic solution, such as Carrel-Dakin fluid, a much more illuminating picture could be presented in favour of the Winnett-Orr technique than Dr. Williams had been able to present for antitoxic serum. At one time Dr. Colquhoun had worked in a ward in which the children on one side were treated by the Winnett-Orr method and those on the other side were subjected to the other treatment he had indicated. The attitude of the children was entirely different; the ones treated by the Winnett-Orr method were happy and free of pain and the other children lived in a state of terror, either of the painful dressings or of the anticipation of general anæsthesia. He had noticed also a peak in the temperature chart, which came each time after disturbance of the dressings. Dr. Colquhoun said that he would like to deal particularly with the problems of the diagnosis and when to operate. In the previous two and a half years some twelve to fifteen of these patients had been in his care. Early in this period he had opened the hip joints of two patients with arthritis and had not found any pus; the condition had cleared up with the administration of salicylates. On the other hand, a patient who had had salicylate treatment for four days on account of signs and symptoms localized at the proximal end of the femur, had been operated on by him. He did not find any pus in the joint even after exposing the joint from behind. Seven days later a sinus appeared slightly proximal to the operation wound. The patient had osteomyelitis of the ileum and had made a good recovery. Four months later there had been some limitation of movement, but no pain. Radiographically it could be seen that the process had been slowly extending in the ileum, and after one year it had broken through and caused septic arthritis at the hip joint. The patient's joint had become ankylosed since.

In a case of osteomyelitis of the upper end of the femur the diseased area had been drained in the usual way, but it had extended through the length and breadth of the femur, despite the administration of antitoxic serum. In the end he had removed the shaft and had immobilized the limb for five months. In this case Dr. Colquhoun was satisfied that diaphysectomy had been worth while.

In the case of a little girl with osteomyelitis of the proximal end of the fibula Dr. Colquhoun said that he had felt inclined to perform diaphysectomy at an early stage, but he had removed only 5·0 centimetres (two inches) of the shaft. The child's general condition had improved; but it had been shown radiographically afterwards that the process had extended throughout the whole length of the shaft, and he had been sorry that he had not removed it completely. After two months the raised periosteum had become revascularized and the bone was regenerating. The child was still undergoing treatment. An abscess had developed a month before the meeting, and in the meantime Dr. Colquhoun had opened the abscess and removed sequestra.

Dr. Colquhoun said that in the light of this experience he felt that partial or complete diaphysectomy had at times to be considered; but he was of the opinion that time should be allowed for the formation of a firm involucrum first. Saucering also had a place in the surgery of this condition. He had had six cases in which he had not been content with drilling. In favourable cases the process had not extended; regeneration had been rapid and the limb had been up in plaster for six to twelve months without sinus formation and without metastases. In conclusion Dr. Colquhoun stated that he would not withhold serum or anything else that would do anything to help these children; for he had seen some appalling disasters from this terrible disease.

Dr. Williams, in reply, said that it was a fact that there had not been any serum reactions. There had been no immediate anaphylaxis and no serum sickness. He thought that on this account one could give large doses safely, even intravenously. He appreciated the way in which his paper had been received, and wished to thank all those who had been associated with him in connexion with this piece of research work.

NOMINATIONS AND ELECTIONS.

THE undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Meyer, Moritz, L.R.C.P., L.R.C.S.E., 1937 (Edinburgh), L.R.C.P. and S., 1937 (Glasgow), c.o. Bank of Australasia, Melbourne.

Medical Societies.

REPATRIATION DEPARTMENT MEDICAL OFFICERS' ASSOCIATION.

THE annual general meeting of the Repatriation Department Medical Officers' Association was held in Melbourne on August 5, 1937.

The accompanying report has been forwarded for publication.

The following members were elected to office:

President: Dr. J. V. Griffiths.

Vice-President: Dr. W. J. Beveridge.

Honorary Secretary: Dr. Noel Pryde.

Honorary Treasurer: Dr. J. Smythe Yule.

Committee Members: Dr. Bernard Garrett, Dr. T. L. Tyrer.

Trustees: Dr. Kenneth Smith, Dr. A. H. Melville.

Auditors: Dr. S. McLennan, Dr. H. I. Gibb.

Membership now stands at thirty-four; all eligible medical officers in the several States (with the exception of New South Wales) are now members of the Association. The Association is now in a very stable condition and its financial position is sound, with the result that the annual subscription rate has this year been halved.

During the past year the Association's non-medical activities have been directed mainly to the questions of superannuation and long service furlough for, and medical defence of, its members. The ensuing year will find the executive committee's attention focused upon the procuring of improved internal conditions of service, whilst the efforts already made regarding superannuation and long service furlough will be sustained if necessary.

It is pleasing to note the improvements that have been and are being made to institutions in all States for the treatment of returned soldiers.

Australasian Medical Publishing Company, Limited.

ANNUAL MEETING.

THE annual meeting of the Australasian Medical Publishing Company, Limited, was held at The Printing House, Seamer Street, Glebe, New South Wales, on September 6, 1937, Dr. A. M. Davidson in the chair.

Directors' Report.

The Directors' report was presented as follows.

The Directors submit their report for the twelve months ended June 30, 1937, and the balance sheet as at June 30, 1937, together with the profit and loss account for the twelve months ended June 30, 1937.

THE MEDICAL JOURNAL OF AUSTRALIA maintains its standard and the volume that was completed with the issue of June 26, 1937, was the largest in the history of the journal.

Additional machinery was installed during the year to cope with the extra work in the printing and publishing department. This department continues to turn out a large volume of work of high quality, and with a view to further expansion in the future, the company acquired the two semi-detached houses adjoining The Printing House.

Depreciation amounting to £1,052 13s. 6d. was written off during the year and an amount of £450 has been provided for taxation. The company's reserves are used in the business and we consider that the state of the company's affairs is satisfactory. A small surplus remains after provision has been made for the payment of debenture interest for the twelve months ended June 30, 1937.

Dr. R. H. Fetherston and Dr. T. W. Lipscomb retire from office by rotation, in accordance with the Articles of Association (Article 39). They are eligible and present themselves for reelection.

A. M. DAVIDSON,
August 30, 1937. Chairman.

Election of Directors.

Dr. R. H. Fetherston and Dr. T. W. Lipscomb were reelected to the Board of Directors.

Obituary.

ALAN NEIL YUILLE.

WE are indebted to Dr. W. C. Sawers for the following appreciation of the late Dr. Alan Neil Yuille.

The death of Dr. Alan Neil Yuille on July 21, 1937, after a short illness, marks a great loss to the medical profession of western New South Wales, and also to his many

friends. As one who has had the good fortune to have been very closely associated with Alan Yuille from his early childhood, I endeavour to contribute, however inadequately, this short account of his career.

Alan Yuille was the second son of the late Mr. Archie Yuille, of Melbourne, and was educated at the then well-known private school "Cumloden". At school he proved an able scholar and a fine all-round athlete, but was still more outstanding for his strong and lovable character, which has been so noticeable throughout his career. After he finished his medical course at the Melbourne University in 1910, there followed two years in Perth, Western Australia. As medical officer at the Perth General Hospital and later the Children's Hospital, Alan Yuille's natural aptitude for surgery was early apparent, and his skill and sincerity in his work fully justified the confidence he inspired in his patients even in these early years. On completion of his hospital work, Alan Yuille started general practice first at Narromine, New South Wales, and later at Dubbo as partner with the late Dr. Burkitt, and quickly became known for his surgical skill. On the outbreak of the Great War, greatly to Dr. Yuille's disappointment, his partner's prior claims prevented his immediate enlistment, which, however, followed directly on Dr. Burkitt's return. Despite offers of surgical work at casualty clearing stations, Alan Yuille was insistent on serving in the forward areas in France, and had a distinguished war record in the First Australian Field Ambulance.

Subsequent to the War, an ever-increasing surgical practice at Dubbo claimed all his attention to such an extent that, for many years, it was apparent that he was sacrificing himself to cope with demands of his practice, and had little or no rest or leisure.

Additional to the strain of his surgical work have been his efforts, as a public citizen, so willingly contributed for the advancement of the interests of the people and town of Dubbo. The recent conferring of the O.B.E. came as a very fitting and well-earned recognition of his services.

It is sad indeed that, at the early age of forty-nine, at the height of his powers, Alan Yuille should have become the victim of a fatal and inoperable condition. Although well aware that his condition was without hope, he faced this final issue, as he had faced the problems of life, with the quiet courage that had endeared him to all.

The deep sympathy of all his many friends will be felt for his wife and four children, of whom the two elder boys have already commenced their medical courses.

Dr. J. F. Rossell writes:

Those of us who were with Alan Yuille in France in 1918 learned to admire and love him more the longer we were with him, and the short periods of leave in his company are still a happy memory.

His surgical ability and unique experience were a tower of strength to the work of the First Field Ambulance, and later to the First Divisional resuscitation team. His cheerfulness under all conditions, his helpfulness to his younger colleagues, and his thoughtfulness towards others endeared him to all the members of these units.

He was always doing some job to help others and did not cease where duty ended. Any forced inactivity galled his energetic spirit.

After active service, contact with him in western New South Wales was a renewed joy. He was loved all over the west for his great kindness to all, both rich and poor. The time or the place never hindered the cheerful word and the kindly action and smile, more especially to those who were down and out. He always acted generously himself and was impatient with anything mean or small.

One hears from all kinds and conditions of men expressions of sorrow at the passing of a well-loved friend.

Dr. Willoughby Flower writes:

There came to western New South Wales some twenty-one years ago, first to Narromine, and then the larger centre, Dubbo, a vivid personality in Alan Neil Yuille. By hard work and sparing himself not at all, his merit soon brought him to the position of a leading man in his chosen profession, well known and well liked throughout the west. Many another practitioner has had cause to be glad of his help and advice in times of difficulty and trouble. Many a person lying sick unto death in some distant town has had cause to give thanks for his skill and timely aid. With his distinct flair and liking for surgery, the west of New South Wales has been well served for many years.

He was generous to a fault, and there are many who have had cause to remember him forever with gratitude. His untimely death while in the prime of life is just too hard to understand. A. N. Yuille was a very keen golfer, a low-marker, and the sponsor and founder of the local links, whose beauty and lay-out were visioned in his mind, and he lived to see them a joy for all to behold. His activities included the presidency of the Returned Sailors and Soldiers' Association, foundation member and first president of the Rotary Club, and member of the hospital board in the past when such activities were permitted us. A scheme has been launched to erect a very modern operating theatre at the Dubbo Hospital to his memory, a very fitting tribute to one who spent so much of his time and of himself in surgical aid to the sick poor.

JOHN GILLEN.

WE regret to announce the death of Dr. John Gillen, of Adelaide, which occurred on September 6, 1937, at London.

Books Received.

MINOR MALADIES AND THEIR TREATMENT, by L. Williams, M.D.; Seventh Edition; 1937. London: Baillière, Tindall and Cox. Crown 8vo, pp. 451. Price: 10s. 6d. net.

SYNOPSIS OF OBSTETRICS AND GYNÆCOLOGY, by A. W. Bourne, M.A., M.B., B.Ch., F.R.C.S., F.C.O.G.; Seventh Edition, fully revised. Bristol: John Wright and Sons Limited. Crown 8vo, pp. 456, with illustrations. Price: 15s. net.

THE PARENT-CHILD RELATION: THE PSYCHOLOGICAL BACKGROUND AND OTHER PAPERS, by H. G. Baynes, S. Crown, S. H. Lubner, A. C. Court, M. Marcus and F. G. Crookshank; 1937. London: The C. W. Daniel Company Limited. Medium 8vo, pp. 71. Price: 2s. 6d. net.

DISORDERS OF THE BLOOD: DIAGNOSIS, PATHOLOGY, TREATMENT AND TECHNIQUE, by L. E. H. Whitby, C.V.O., M.C., M.A., M.D., F.R.C.P., D.P.H., and C. J. C. Britton, M.D., D.P.H.; Second Edition; 1937. London: J. and A. Churchill Limited. Medium 8vo, pp. 582, with 12 plates and 60 text figures. Price: 21s. net.

THE ROLE OF CHEMIOTAXIS IN BONE GROWTH, by A. P. Bertwistle, M.B., Ch.B., F.R.C.S.; 1937. London: Henry Kimpton. Medium 8vo, pp. 71, with 32 illustrations. Price: 8s. 6d. net.

Diary for the Month.

SEPT. 21.—New South Wales Branch, B.M.A.: Ethics Committee.
SEPT. 22.—Victorian Branch, B.M.A.: Council.
SEPT. 23.—New South Wales Branch, B.M.A.: Clinical Meeting.
SEPT. 24.—Queensland Branch, B.M.A.: Council.
SEPT. 28.—New South Wales Branch, B.M.A.: Medical Politics Committee.
SEPT. 30.—South Australian Branch, B.M.A.: Branch.
SEPT. 30.—New South Wales Branch, B.M.A.: Branch.
OCT. 1.—Queensland Branch, B.M.A.: Branch.
OCT. 5.—New South Wales Branch, B.M.A.: Council (Quarterly).
OCT. 6.—Victorian Branch, B.M.A.: Branch.
OCT. 6.—Western Australian Branch, B.M.A.: Council.
OCT. 7.—South Australian Branch, B.M.A.: Council.
OCT. 7.—Tasmanian Branch, B.M.A.: Council.
OCT. 8.—Queensland Branch, B.M.A.: Council.
OCT. 12.—New South Wales Branch, B.M.A.: Organization and Science Committee.
OCT. 12.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
OCT. 14.—Tasmanian Branch, B.M.A.: Branch.
OCT. 19.—New South Wales Branch, B.M.A.: Ethics Committee.
OCT. 20.—Western Australian Branch, B.M.A.: Branch.
OCT. 21.—New South Wales Branch, B.M.A.: Clinical Meeting.
OCT. 21.—Tasmanian Branch, B.M.A.: Council.

Medical Appointments.

The following appointments have been made at the Royal Alexandra Hospital for Children, Camperdown, New South Wales: Dr. L. Dey, Honorary Physician; Dr. L. Dods, Honorary Assistant Physician; Dr. S. G. Bradfield, Honorary Relieving Assistant Physician.

* * *

Dr. G. Courtney has been appointed Medical Superintendent at the Aboriginal Settlement, Palm Island, Queensland, in accordance with the provisions of *The Aboriginals Protection and Restriction of the Sale of Opium Acts*, 1897 *to* 1934, and *The Public Service Acts*, 1922 *to* 1924, of Queensland.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," pages xviii to xx.

AUSTIN HOSPITAL FOR CANCER AND CHRONIC DISEASES, HEIDELBERG, VICTORIA: Medical Officer.

COMMONWEALTH DEPARTMENT OF HEALTH, CANBERRA, F.C.T.: Medical Officer.

ROYAL NORTH SHORE HOSPITAL OF SYDNEY, NEW SOUTH WALES: Honorary Dermatologists.

TAMBO HOSPITALS BOARD, TAMBO, QUEENSLAND: Medical Superintendent.

THE EASTERN SUBURBS HOSPITAL, WAVERLEY, NEW SOUTH WALES: Honorary Assistant Orthopædic Surgeon.

THE UNIVERSITY OF MELBOURNE, VICTORIA: Part-Time Lecturer and Demonstrator in Pathology.

YALLOURN HOSPITAL, YALLOURN, VICTORIA: Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135 Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178 North Terrace, Adelaide.	All Lodge appointments in South Australia. All contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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